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Editorials

HEALTH INSURANCE, NO MATTER HOW IT IS SOLD TO A NATION, DOES NOT PROTECT, NOR CONSERVE, NOR IMPROVE THE HEALTH OF THE PEOPLE

Social insurance or tax supported medical service in its many ramifications, but especially health insurance, is assuming in those countries that have borne it longest, every trait of poor Sindbad's devastating Old Man of the Sea. The thin, dying creature by the river who wanted only transpose across, once safely settled on the youth's back, began to grow to enormous proportions and to torture fiendishly its human steed.

Such is the history of health insurance in those countries, among others, Germany, Austria, England—where it has been in existence for decades and where it has become firmly established.

Germany was the first to sponsor the parasite. At that time Germany was in the lead in things medical.

German surgeons, German medicines, German clinics, German laboratory research there lay Mecca for the ambitious students or doctor over fifty years ago. About that time social or health insurance made its descent upon the back of the German people. Where, we ask, is the once bright future of German medicine today?

Behold it, a broken emasculated thing struggling to travel beneath its politically imposed "Old Man of the Sea." An Old Man of the Sea, too, is urging the United States to assume similar burdens in the form of health insurance and tax-supported medical service. That such persuasion comes from a political bureaucracy in no-wise minimize the danger. Social insurance was the red ribbon on the glass in which Bismarck, Tammany gone Royalist, threw a drugged sop to the ever burdened German workingman.

Health in the middle half of the nineteenth century was almost as much of a luxury as diamond necklaces. Fine medical care was kept for

princes or for those who won the bounty of the great lords. Bismarck, half fox, half lion and a diplomat worthy of the Vatican, cast about for "bread and circuses" for the Teutonic poor, and found it in promise of free medical and surgical and obstetrical care, for which the beneficiaries if they wished might donate a few assessments. The German, and especially the socialistic German, is always long on the assessment or mutual payment idea, even if it is an assessment in name only.

Now Germany and her English cousins have discovered that economic schemes born in times of plenty are sadly out of joint in the lean years. Take some recent figures from the German front.

Professor Winslow of Yale University is authority for the statement, that for sickness insurance alone the German laborer must set aside something more than eight per cent. of his income (8.5% to be exact) and that the employer for the same purpose adds five per cent more. Statistics in the United States claims that the average cost of medical care to the citizenry is something like three per cent. of the income. Undoubtedly Germany's other ten and five-tenths per cent. (10.5) is used for paying salaries and buying red tape for the tremendous political bureaucracy needed to handle the German social insurance system . . . the medical Old Man of the Sea. Not only cost but time lost from labor is excessive in Germany. Back in 1913 the German workman was accredited with 9.2 days of loss of labor for illness (with insurance) as against something over six per cent. time loss for the American worker. This ratio is practically the same in the United States today, *but in Germany it has increased to almost* 17%. The total number of days of sick benefits in Germany have increased two and one-third times since 1913; its cost of administration has almost trebled and it has become necessary to add a state subsidy as well as to decrease the time and amount of benefits in a ratio varying from 40 to 70%.

All of which, easily verified by authenticated statistics does not lay any ribbons on the brow of the practicality of health insurance as the German nation bears this burden.

Aside from this economic standpoint to industry, to labor and the state, look at the economic viewpoint of the medical profession. The panel doctor gets the patient after he has had two lay bookings with his soul and his body practically eviscerated on record books of the gossipy laity. The average panel doctor sees from 50 to 200 patients daily at a compensation of something like eight or ten cents per patient. The state furnishes bandages, medicines and the like and the results are a great deal like the bureaucratic nabob who during the recent World war, in spite of the fact that although "America had only 85,000 horses," according to Collier's Weekly, "some imaginative individual placed orders for 945,000 saddles; 1,000,000 horse covers; 1,500,000 halters; 2,000,000 feed bags, and 2,800,000 halters."

That's the sort of waste that happens under any government controlled undertaking when the politicians are at the fore, and there is sugar to be sprinkled about for its constituency. The doctors and the taxpayers in Germany have found that out.

Health insurance, no matter how it is sold to a nation, does not protect, nor conserve, nor improve the health of a nation. But it has been proven to shine like a morning star to guide the greedy politician to a fat pocketbook and easy jobs for himself and his kin, lo, to the fourth generation.

Health insurance by any name is one of those windbag Santa Clauses that may have been practical on Mount Parnassus but have no place in the economics of any sane, rational, self-respecting, self-supporting people. It is an elusive chimera, swallowed gaily by those misguided individuals to whom the "government," "state subsidy" and the like are the pot of gold at the end of the rainbow which made of every dolt a genius and of every sluggard a man of wealth and consequence. "It is natural for man to indulge in the illusions of hope," quoth the great Patrick Henry. For the poor man, and for the burden shifting rich one, it is natural to have faith in such straw mannikins as health and tax supported medicine.

That there should be some way of equalizing burdens of illness between the rich and the indigent without making the medical profession the buffer state is to be admitted. But that way does not lie in so-called "health insurance" or tax-supported medical practice, which merely adds more taxes to a nation now so crippled by terrible taxes that industry can scarcely function and the private individual on every side has his

own private Old Man of the Sea dragging him down to inefficiency and despair.

The "Medical Annals of the District of Columbia" published somewhat recently excerpts from a brochure entitled "Will America Copy Germany's Mistakes," which was written and translated for the Pennsylvania Self-Insurers Association, Finance Building, Philadelphia. For this the author is Gustav Hartz, a seasoned and prominent labor leader in the land of Hitler and Nazis. Excerpts therefrom are as enlightening as they are appalling:

"It is not advisable to give ear to the biased experiences of advocates of social insurance who in many cases draw profits therefrom for there is no institution in the world that is so much extolled and the praise of which is so little justified as social insurance."

"To consider unemployment insurance an achievement of recent years, to call it the 'crown of social insurance' is a mistaken view for every social insurance is unemployment insurance whether the unemployment is due to illness, accident, early incapacity, old age or to being out of work."

"It may easily be proved that social insurance is not only caused by lack of means but even makes of it a social principle, aggravates it, spreads it, makes it permanent."

"Woe to the state which imagines that crises may be alleviated or stopped by the introduction or the existence of a comprehensive system of social insurance. . . Every economic crisis swallows up the best organized social insurance and consumes its funds at both ends—at the end of the diminishing premiums and at the end of the increasing benefits. In the time of her hardest social crisis, social insurance was Germany's greatest inner trouble."

"In Germany the most firmly convinced fanatics on social insurance—such people do still exist and in most cases they fare very well—are even now sure that unemployment insurance 'is not an insurance really.' In 1927 this 'Crown of social politics' was introduced, with fixed premiums and fixed benefits. Three or four years later nothing was left and all that remains of unemployment insurance today is its name. Now the welfare principle is applied for the unemployed; insurance allowance without examining the necessity, namely, with legal rights for six weeks only. Juveniles and working women have no legal claim.

"The period for which benefits are made must of course be limited, as with a subscription of 6½ per cent of their wages not all unemployed can be supported. The greater the number of unemployed, the lower the limit must be set. At first the allowances were made for 26 weeks, now for six weeks. As in this crisis, unemployment frequently lasts for years, and most of the unemployed no longer receive any allowance. The unemployed insurance at present scarcely supports one-third of the army of unemployed, while the other part is supported by the welfare and the crisis centers. The same was the case before social politics had their 'crown' put on. These institutions draw their funds from the State revenues."

"It is not in the least different with the sick insurance. The unevenness in the business level, the seasons, holiday, a change of work, failing health and many other things contribute to bring about a noticeable change in morbidity. Since the sick insurance has been in effect, the average number of days of incapacity to work owing to ill-health has risen from 5½ to 28 days, although health in general has considerably improved. In the strict sense of the word the sick insurance is no insurance either. From a technical and mathematical standpoint it is also quite unsettled in view of the moral hazard noted above.

"This is clearly seen when considering that the individual insurance case, whether due to illness or unemployment, can be willfully caused or extended. Where is the borderline between illness and health, between mere indisposition and illness, between dread of getting ill and bluff? And if the insured person is really ill, where is the borderline between ability or disability to work? How can the duration of an illness be fixed?

"Illness is the most incalculable risk in existence.

"Even the doctor is mostly, or at least frequently, unable to diagnose correctly and to distinguish pretenders and hypochondriacs from really sick people, or rather to tell whether a man is fit to work or not."

"Of all the risks in social insurance only old age, death, and number of dependents can be exactly established. These are, therefore, the

only cases in which an unobjectionable actuarial basis, and an unquestioned legal claim are possible. Everything else is hazy and uncontrollable."

"Dread of illness obsesses most people, and this has been pressed into a system "illness made easy," by which the will be to be well is strangled. The doctor is consulted a dozen times where once would be sufficient—the insurance pays. The prescribing of medicine, bandages, etc., is desired. When they have been obtained they lie about until they are no longer fit to be used and must be thrown away—the insurance pays. Besides, it is nice to get something in return for the premiums paid year in and year out. Excessive 'overdoctoring' is the result, and fear of illness shakes the will for recovery—the best aid to health. Pretenders and hypochondriacs are bred and the use of medicine becomes excessive. The advertising of certain remedies and cures created a medicine craze. A few years ago it was ascertained that four times as much money as used for doctors' fees and medicines for 35,000,000 of people in insurance as for 30,000,000 of uninsured. This was stimulated, unthinkingly by a desire to get sick money. An actual run on the sick insurance allowance set in.

"At first sight it seems improbable and paradoxical that a desire to obtain sick money that scarcely amount to half the sum of wages should arise. It appears impossible that someone should, unless compelled by illness, forfeit his wages to get an allowance of half the amount. Unfortunately life does not run a straight course between health, working ability, working possibilities on one hand, and illness and disability on the other, nor do people's minds and actions.

"In millions of cases, for example, when wages are being decreased, when work is scarce and work hours in consequence shortened, when there are fewer shifts, many holidays, work restrictions at certain seasons, outdoor work in frosty weather, 50 per cent. of the wages is welcome. One objects to the work he is given, another does not feel like working, a third's time is taken up by some family matter for which he would have to take leave of absence and forfeit his pay. In such cases the sick insurance comes in handy. Besides this, there is also deceitful trickery. Fictitious contracts are made, doctors are induced to prescribe medicine, and instead of the medicine, toilet soap and scent, etc., are handed out by the pharmacies.

"How can this possibly be done, some ask. Those who consult doctors are supposed to be ill. That is all very well if the doctors were always able to detect whether the statements of the patients were correct. Often a diagnosis is impossible. He who would like to prove this should go to ten doctors, complain of headache, pain in the limbs, rheumatism. All ten will start a treatment for headache or rheumatism, without discovering that nothing whatever is the matter with the patient.

"Besides that, all doctors are glad to get new patients, for do they not mean their livelihood?

"Medical science has become a cheap article, and doctors have given up conscientious treatment. The genuine patient is neglected, is not given the necessary care.

"The greater the mass consultations, the lower are the doctors' fees. The amounts paid to panel doctors for each single case are deplorable. They are, therefore, compelled to resort to mass practice.

"The sick insurance unrolls the entire prolem of the medical man's existence. Mass demand compelled a limitation in the use of medicines. Doctors must not prescribe what they consider good for the patient, they only being allowed to give remedies entered in a book of medical regulations for insurance purposes.

"The insured workman becomes a second class patient."

"The genuine patient is justly indignant to find that the existence of his illness is doubted, and that he who has always paid his premiums regularly and has a right to demand conscientious attendance, is considered a cheat.

"This system, together with the rest of the bureaucratic apparatus, has wedged itself between doctor and patient, completely destroying the patient's confidence in his physician, which greatly retards all recovery."

"In the beginning nobody thought of insuring all workmen, merely needy ones. But soon everybody was 'needy.' Today, with members of families included, two-thirds of the nation are compelled to be insured."

"Liberty and progress are possible only where the will to get on and to accumulate capital is not hindered, but furthered."

"During the last few years the administration costs amounted to 400 million marks annually.

The costs cannot be called too high and cannot possibly be materially reduced.

"However, the whole matter gets another aspect in view of the fact that these expenses are covered by workmen's premiums and are deducted year by year from the money intended for these men's support. In one worker's generation—say from the age of 20 to 60, or 40 years—it means the gigantic sum of 16,000,000,000 marks, which, therefore, is lost from the funds originally intended for sick, unemployment and old age insurances.

"An army of about 70,000 officials is required to handle part of the wages of the workers under compulsory administration, for what else is social insurance?"

"Premiums started on a modest basis. The first were 1½ per cent. for the employee and ¾ per cent. for the employer. Today, the entire premium averages almost one-fifth of the amount of the wages and for minors it is nearly 30 per cent. The involved way in which the contributions are divided between employer and employee is omitted here, as an alteration is pending. It is expected that employer and employee will in future bear equal share, about 10 per cent. each. Is it to be expected that an employer can afford to make an employee a present of 10 per cent. in addition to his wages?"

"The only part of the wages he might be able to save in order to build up a capital is taken from him, thus preventing him having any resources of his own. Whether he wants to or not, he is doomed forever to remain a proletarian. It is social insurance, therefore, that makes needy people, in order to give them after they have become needy, very inadequate support. Social insurance originally was established to help those in distress. Now these are poor of its creation."

IS THERE A MALE CLIMACTERIC?

Opinions of medical men are found to be diametrically opposite in their views pertaining to a male climacteric. The most of those who have given any attention to the subject, associate the term with rejuvenation or re-erotization. The subject is frankly displeasing to many, although much specious reasoning is advanced to persuade the skeptical that there is a male climacteric, and that it should receive more careful investigation of doctors. Despite this division in medical ranks there are numerous workers who believe that there is a period in the lives of men somewhat like the menopause in women. For example Ferguson[1] writes, "Evidence is accumulating, and opinion is becoming more concrete, towards the conception that in man there is a real climacteric, comparable in in its nature though not in its precision with the menopause in women." His opinion will be accepted with a greater degree of grace by those who are uncompromising in their attitude toward such a theory when they are told that he derides Voronoff in clear cut terms by saying, "Is not Voronoff's claim buttressed by the unsolicited testimonials of six hundred libidinous septuagenarians?"

Nearly all who have written about the male climacteric point to changes that take place in the prostate, among which are acute and chronic inflammation, atrophy and malignant growths. There appears to be a general unanimity of opinion pertaining to the frequent appearance of prostatic trouble in men when they begin to grow old. One must not lose sight of the fact that other serious ailments frequently declare themselves between the ages of 45 and 60, however. Prostatitis may be accompanied by such serious ailments as rheumatoid arthritis, diabetes, interstitial nephritis or arterio-sclerosis. If there is a male climacteric doctors will sooner or later weave their facts and deductions into a more enduring fabric. It is true that there is much more than shreds of acceptable knowledge relating to a male climacteric, but the greater part of present-day literature on this subject has no scientific foundation, and some of it consists of pure conjecture and individual opinions. When presenting this subject there appears to be a definite tendency to give sovereignty to rejuvenation, and it is clear that some writers confuse this term with re-erotization. One must admit that there are certain glandular products which stimulate the sexual organs, but it is a question whether this effect means rejuvenescence. It is not likely that even stanch proponents of "a male climacteric" will contend that stimulation and refreshing of certain glands should be accepted as a return to the natural condition found during youth—the juvenis.

1. Ferguson, J. F.: Problems of Old Age, Glasgow Med. J., 112:225, 1929.

However, old men who derive satisfaction from a return of sexual vigor, be it ever so slight, will accept the change as rejuvenation despite contradictory opinions.

If it were possible to obtain every fact pertaining to the lives of a chosen group of old men, one might then succeed in correlating such information and finally arrive at definite conclusions relating to a climacteric. It should be obvious that such a venture is highly improbable, but until that can be done comparatively little can be set down as factual data. Many men are, without doubt, extremely unhappy when they find themselves unable to obtain satisfaction from sexual congress. Conversely, it is believable that by far the greatest number of men are happier when this passion wanes. Desires of the first group can be likened to uncontrollable desires of young male animals of every species, as we see beautifully expressed in the Georgics of Virgil: "Indeed every kind on earth, both men and wild beasts, the fish, the cattle, and painted birds, rush into maddening fires; love is in all the same . . . they climb the mountains, swim the rivers . . . over rocks and cliffs and hollow vales they scour." A saying of Sophocles is descriptive of the second group. He writes, "The gods give me something better (than venereal pleasures); nay, I have run away from them with gladness, as from a wild and furious tyrant."

There seems to be an increasing number of writers from year to year who attribute certain changes in men between the ages of 45 and 60 to something akin to the menopause in women—this male climacteric, which some believe is a distinguishing mark of life's full maturity. If all the bizarre mental quirks and stories that are revealed to physicians by women passing through the menopause were incorporated in a book, it would be of considerable size. And to a certain extent a number of aging men show almost identical symptoms such as marked anxiety and instability at about the time their potency diminishes. This can be regarded as a coincidence, however, and some do so regard it. At that time aging men may be deeply introspective and nurture obsessions that, apparently, cannot be eradicated from their minds. Some have phobias that add to their distress, and these pave the way to fears of chronic invalidism or insanity. A number give way to tears in much the same manner as women do during the menopause, and it is said they find no pleasure in living. Occasionally we read about old men who have lost all sense of decency and self-respect in relation to sexual matters. Strange actions showing loss of self-control and an absence of decency in an old man may eventually startle his friends when they learn that he has even been accused of bestiality.

Until investigators present more substantial evidence in favor of a male climacteric, there are many who will not believe that some of the symptoms just mentioned are due solely to loss or even impairment of the sexual function. Who can point to any great difference between the escapades and the crimes of aging eunuchs, renegade ascetics, or men whose sexual accomplishments are, apparently, as virile as during the days of youth? Many of these strange symptoms laid on the threshold of a climacteric in man, might be fitted into a mosaic consisting of one or more types of insanity that no psychiatrist has even connected directly with loss of sexual vigor alone. While we are still groping toward a better understanding of various forms of insanity, we are constantly adding to or eliminating etiological factors. We seek to determine what is meant by a normal human being, and we are in despair when we undertake to be dogmatic and create acceptable definitions for the terms sanity and insanity. One thing we can be certain about, however, is that if the first human beings had perfect or normal minds the greater part of those who followed them down through the ages, are responsible for abnormal minds of today. In like manner we are still groping for facts relating to a male climacteric. We are not yet ready to accept loss of sexual vigor as the etiological factor of greatest importance in the causation of certain strange departures from normalcy that occasionally are observed in aging men.

WILL THE DOCTOR OF THE FUTURE BE PAID FROM A FUND RAISED BY TAXES?

Will the Doctor of the future be able to continue as an individual practitioner, or will he become an agent of the State? Will the physician of the future be paid by the patient, or

from a fund raised by taxes? These questions which a few years ago seemed so impossible are being asked today by all the physicians of the United States.

The question of tax supported medicine is of vital importance to every individual. It is in line with present government policies, and bears all the earmarks of being more significant during the coming five years. The progress in the field of medical science with accompanying rise in costs and a retrogression in the economic status of our people, constitutes the nucleus of our scientific and economic problem.

A M A IS DEMOCRATIC

The A M A is a one hundred per cent democratic institution and does represent the opinion of the rank and file of the physicians of Illinois and of the United States and does hold the complete confidence of its 110,000 members. It is high time the government officials, lay organizations and endowed foundations realize that the one and only group that can speak for American Medicine officially is the House of Delegates of the American Medical Association.

GOVERNMENT OF THE UNITED STATES IS TOO TOP HEAVY

As we have repeatedly said over a couple of decades we are suffering from over-centralization in Government. The government of the United States is becoming too top-heavy, a dangerous state, which in the past has wrecked, not only nations, but attendant civilizations.

We are now fast approaching this stage. Indeed the goodly portion of the people believe that we have already reached the stage of over-centralization with its accompanying menace a rule of the people by bureaucracy.

Taxes are both food and poison in that they may give life or they may destroy life.

Governments cannot employ and support people—only business and industry can, because they provide the things people want. All government can do is redistribute and apportion to provide certain services.

Medicine, as well as business and industry must have encouragement or they can't give service and go ahead and provide the things people need and want. Our government is over-centralized and entirely too top-heavy.

FORMER ATTORNEY GENERAL ATTACKS SUPPORTED MEDICINE

We quote from the *Illinois Dental Journal*, 1937, an attack on tax supported medicine by Thomas D. Thacher, former solicitor general of the United States and chairman of the New York City Charter Revision Commission. The address was given at the annual meeting of the New York Academy of Medicine. Mr. Thacher said that the fallacy of tax supported medicine is that it would blanket the country without regard to local conditions and individuals.

Mr. Thacher challenged also the constitutionality of socialized medicine under the proposed system of compulsory health insurance. He added that the states had no power to enforce for such insurance a sliding scale of costs between those in the upper and lower income brackets, or to take the money or property of the rich and give it to the poor. "Generosity in relieving distress is characteristic of our people, and particularly characteristic of your profession," he said. "But we pefer to do our own giving."

"To put it concretely," he said, "figures indicating averages for the whole of the United States are made the basis for the universal application of a single remedy without consideration of the local conditions under which it is applied. This is a peculiarly erroneous method of thought, and an extraordinary dangerous method of action."

Mr. Thacher pointed out that even the majority on the Committee on the costs of Medical Care did not favor attempting to impose upon the country or upon any community, a preconceived plan for the reorganization of medical service. On the contrary, he said, it pointed out the needs of the profession and of the people, which should be met in a process of evolution by which the profession could more effectively serve the people and be more adequately paid.

Mr. Thacher said that if the plan was to be compulsory it must have force of law and in that event might be authorized only by state legislation. "Ordinarily," he continued, "a state legislature will and must have regard for local conditions and local institutions. If, however,

the Federal government, following the pattern of the Social Security Act, should provide Federal appropriations in aid of compulsory health insurance, provided for under state statute, then pressure upon the legislatures of the states to set up such systems at the cost of the Federal government might very well result in such enactments without due consideration of the local institutions and the local needs.

"Serious question would certainly be raised as to the constitutional validity of such laws if they are made compulsory and if there is discrimination in the cost of such insurance as between those in the upper and those in the lower income brackets," Mr. Thacher said. "It is a great temptation to be charitable with other people's money, but the Constitution denies that privilege to the Legislature, althougt this limitation may sometimes be avoided through an exercise of the taxing power."

Mr. Thacher pointed out that the services of all the great hospitals, dispensaries, clinics, health stations and maternity centers, with all their equipment and technique, were available to the poor of the city. In addition, he said, W.P.A. workers and those on relief got medical and nursing card free. He said the problems in the South, where 5,000,000 persons live beyond the reach of medical and nursing care, were economic, and he contrasted this with the problems in New York City, adding that "such problems will not be solved by preconceived plans predicated upon statistics and average drawn from all over the United States.

IN MEMORIAM

Charles Delbert Snively breathed his last on August 2, 1938.

The passing of Dr. Charles D. Snively was a grievous blow to his associates, numerous friends and many acquaintances.

Dr. Snively's work in medicine and among men will not soon be forgotten. He was a genius for friendships and a genius for making men whole. He had too that rare adaptability, too infrequently seen, for making civic affairs and science go hand in hand.

To the practice of his profession Dr. Snively brought the best of American tradition.

Charles Delbert Snively, son of Francis Marion and Elizabeth Laswell Snively, Fulton county pioneers, was born January 20, 1875, at Cuba, Illinois. He was one of a family of ten children, all of whom were graduated from the Cuba High School. Their father was one of the first merchants in that community.

He chose to enter the medical profession and graduated from the College of Physicians and Surgeons at Keokuk, Iowa. He practiced a year at Fiatt, and another in Astoria before going to Summum where he remained for twelve years before coming to Ipava in 1909.

During the year in Astoria he made the acquaintance of Miss Harrietta Rice, daughter of a prominent family in the community, and they were married on March 5, 1902, at Monmouth, Illinois. They had one son, Robert Rice, now married and living in Chicago, where he will gradaute from the College of Medicine at the University of Illinois in 1939.

Dr. Snively is survived by his widow and son, two brothers, Frank R. and George E. of Cuba, and two sisters, Miss Elsie and Mrs. Ruth Higdon of Eureka.

Doctor Snively maintained the highest standards of his profession. He was one of those rare personalities whose sympathy and tenderness and compassion for the needy, the helpless, and the afflicted can only be likened to that of the Great Physician.

Throughout his forty-three years as a practicing physician, he enjoyed the friendship and highest esteem of his associates in the medical profession. He had for many years been an active member of the Illinois State Medical Society, and of the Secretary's Club of that organization, and gained wide recognition in medical circles for the originality of his work in the position of secretary of the Fulton County Medical Society over a period of sixteen years.

During the World War Doctor Snively was a First Lieutenant in the Medical Corps at Fort Oglethorpe, Ga., and rendered outstanding service to his country and his comrades during the terrible epidemic of influenza. He was eligible for promotion, but never asked for the higher rank, seeking not honor for himself but to serve others.

Of a social and friendly disposition, Dr. Snively delighted to mingle with his fellow-citizens in their many activities. He was a Past Commander of Harold C. Hoopes Post No. 17 of the American Legion, the Post Surgeon, and its new Adjutant. He was also a member of the Masonic Lodge, the Knight Templars of Damascus Commandery, Havana, and the White Shrine, and of the Knights of Pythias and Modern Woodmen of America.

He had many times served on the Village Board and was its President at the time of his death. His efforts in behalf of the progress and betterment of the community and its activities and institutions were unlimited.

Doctor Snively was in every sense a personality worthy of note. He came of good stock from a good home. He had a keen sense of justice, always a due consideration of the rights of others, always ethical. His greatest ambition was to do for others.

Few men were ever more devoted to their family. In his numerous travels covering every state in the Union it was his desire that his family share in the joys and pleasures as well as the education. His love of children and thoughtfulness of elderly people endeared him to both old and young.

He had a keen sense of humor as evidenced by

phases of his work as a long time secretary of the Fulton County Medical Society covering a period of 16 years. This was expressed in cartoons, and short pithical expressions in the program-invitations he mailed to the medical men. These programs were known and noted over much of the state.

Doctor Snively took a great interest in civic and community affairs. Was many times a member of the village board and at the time of his death was president of the board. During the activities to secure early action on the construction of hard road known as route 98, he was chairman of the committee to further the project. He, with other members of the committee, assisted by other tactful and liberal contributors, secured the right-of-way in a relatively short time. No worthy community problem or project ever failed to secure his whole hearted support.

It was, however, as a true physician that he excelled. He was a student of medicine, capable of making the best practical application of his knowledge of the healing art. He was not only one of the best informed physicians, but he commanded the love and respect of the community in which he worked. His judgment was always sound, his patients' rights always well guarded and protected.

Doctor Snively was more than a dispenser of medicine. He was a man who, by his mere presence, could work wonders in the sickroom. He was generous with himself, spending himself unstintingly for those in need. His outstanding characteristic was his devoted service to his fellowmen and this service was often rendered without thought of financial remuneration.

One of the truest proofs of this man's greatness of character was the fact that without exception he was loved and respected by the two extremes of life, the children and the aged.

The last rites for Doctor Snively were most impressive. The flag draped casket, surrounded with more than sixty large floral sprays of surpassing beauty was placed on the lawn beneath the sheltering branches of a cherry tree which stands close by his office window. More than one thousand persons from all walks of life came to pay their last respects to their departed friend.

Members of the American Legion and the Auxiliary from Ipava, Vermont and Table Grove attended in a body, as did the Order of the Eastern Star. Twenty-five of his professional associates were present from Farmington, Canton, Rushville, Macomb, Peoria, Lewistown, Cuba, Galesburg, Table Grove, Vermont and Ipava and several fraternal orders were represented.

VITAMIN E

H. A. Mattill, Iowa City (*Journal A. M. A.*, May 28, 1938), points out that in the five years that have elapsed since the publication of the previous symposium on vitamins in *The Journal*, knowledge of vitamin E has been advanced considerably. He gives a chronologic review of the chemical status of vitamin E. The progress of the chemical studies outlined required continuous animal assays of the biologic activity of the products obtained. The most suitable method of assay uses adult female rats, properly prepared by subsistence on a diet deficient in vitamin E. Ability to bear living young following the administration by mouth of varying amounts of concentrates is a measure of vitamin E potency; when the dose is inadequate, the embryos die and are resorbed. There is considerable and thus far uncontrollable variability in the response of individual animals to the same dosage, and few statistical studies have been reported. The reason for this is obvious; until recently the concentrates were all mixtures, and investigators were primarily interested in knowing the minimal effective dose of their preparations. The necessity of vitamin E for normal embryonic growth in animals other than the rat and the mouse has not been established, but several suggestive observations have been made in the field of animal production. The embryonic development of chicks in eggs from hens on a vitamin E deficient ration has shed some light on the abnormalities causing death in the embryo. Definite proof for the value of vitamin E as a remedy for sterility in human beings is manifestly difficult to secure. Many causes and conditions have been shown to be associated with human sterility, and, so far as animal experiments indicate, vitamin E is directly concerned with only one phase of the female reproductive process, namely, the blood supply and nutrition of the embryo, and in the male with the maintenance of testicular function. Administration of a purified wheat germ oil preparation resulted in the birth of living children in many habitual aborters. Massive doses of wheat germ oil have also, according to Shute, been useful in abruptio placentae and have prevented progress of these cases to a severe stage of placental detachment. This clinical experience followed the observation that the blood serum of aborting women had an increased resistance to tryptic proteolysis and that the serum of rats acquired the same property after about four months on a vitamin E-deficient diet; normal digestibility was restored in both cases by administering vitamin E. There is as yet no physiologic explanation for this. More clinical evidence, obtained under carefully controlled conditions, is greatly needed to establish the usefulness of vitamin E therapy in abnormal human reproduction.

IRISH METHOD

An Irish soldier in France during the 1914-1918 war received a letter from his wife saying there wasn't an able-bodied man left and she was going to dig the garden herself. Pat wrote at the beginning of his next letter: "Bridget, please don't dig the garden; that's where the guns are."

The letter was duly censored, and in a short time a lorry-load of men in khaki arrived at Pat's house and proceeded to dig the garden from end to end. Bridget wrote to Pat in desperation, saying that she didn't know what to do, as the soldiers had got the garden dug up, every bit of it. Pat's reply was short and to the point: "Put in the spuds."—*Tit-Bits.*

DO YOU KNOW?

From Science News-Letter

A medical examination before marriage is compulsory in Turkey.

MEDICAL ECONOMICS

H. M. Camp, M. D.
E. P. Coleman, M. D.
W. M. Hartman, M. D.
J. R. Neal, M. D.
I. H. Neece, M. D.

Edited by the Committee on Medical Economics
of the
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Address all letters and communications to the Chairman.

The final paragraph of the September article in this column was of the nature of a "feeler," to sound out the reaction of the medical profession in regard to their interest in politics in the coming election of United States Senators and Representatives. The reaction has been so favorable that the writer is encouraged to tempt fate and continue this article in the same vein, well knowing that he is treading on dangerous ground.

The special meeting of the House of Delegates was held in Chicago last month, and was attended by all the Delegates from Illinois as well as the President, Chairman of the Council, Secretary, and Chairman of the Legislative Committee. We take for granted that every member of the Illinois State Medical Society has read the complete report of this meeting as published in Journal of American Medical Association as of September 24. It will be noted in the final action that the delegates maintained their position that Socialized Medicine is neither needed nor required in the United States, even though they made some concessions to the desires of the Interdepartmental Committee, who held the Health Conference in Washington last summer.

It is, of course, impossible to report the general current of feeling and opinion amongst the delegates in an official publication, like Journal. Nor would be diplomatic to try to give the opinion of all the delegates on any subject, where a definite vote had been taken. However, the delegates from Illinois felt that many if not most of the delegates present felt that the main hope for the future of medicine, was not in any Committee appointed to consult with the Technical Committee of the Interdepartmental Committee, but rather in entering into the coming election with the hope of electing men as Senators and Representatives who understand the desires of the medical profession and will at least promise to give them consideration when the problem is presented to the Congress of the United States for action. Much better than this, would be for the medical profession to support those candidates for election, who give their written promise that they will oppose any attempts to socialize the practice of medicine. This seems to be the practical way to oppose Socialized Medicine. It is of much less importance whether the candidate runs on the Republican or Democratic Ticket, than it is what his stand on the question of Socialized medicine will be when the same is presented to him, as it unquestionably will be, at the next session of Congress. We realize that promises can not always be relied on, but there is a much greater probability of support from a candidate who will at least take a definite stand against socialized medicine before the election, than should be expected from a candidate who refuses to come out definitely either for or against the same. The record of those who have voted for or expressed an opinion favorable to Socialize medicine is so unfavorable that they should not receive any consideration from the members of the medical profession at this time.

With this general thought in mind, several members of the Council requested the Chairman of the Legislative Committee, to get an expression of opinion on this subject from all candidates for Senator and Representatives in the State of Illinois and make this information available to the medical profession of Illinois before the first Tuesday of November, so that they, the members of the medical profession will know on the day of voting exactly which men will help them to defeat any attempt in Congress to start Socialized Medicine in the United States, and who will not. With this information available, it should be very easy for any man to select the proper men to be his representatives in Congress. He should not allow party politics to befuddle him. It is of much less importance to the medical profession of Illinois whether the Senator elected is a Democrat or a Republican than whether he will give assurance

of being on the side of the medical profession in this fight. Every district elects a member of the House of Representatives at this election. It should be easy for the local members of the profession to get an expression of opinion from their local candidates than it is to contact the candidate for Senator. No member of the medical profession is too busy to take a little time off and go to see the candidates for the House of Representatives in his own district and let him know in no uncertain terms what the medical profession wants and attempt to get the candidate to take a definite stand in the matter. If the medical man will let the candidate know that he will vote for the candidate who is friendly to the medical profession and will oppose those who are either unfriendly or neutral, he will have less trouble getting an expression of opinion from the candidate. In addition, the candidate will be affected by the seriousness of the medical profession and pay more attention to their requests, the more members of the profession calling on him. This is the manner blocs and minorities have their influence on Congress and there is nothing reprehensible or unprofessional in so doing. We must not forget that there are two members-at-large to the House of Representatives to be elected at this time. The same methods can be used to influence them, although they are not so well known to the members of medical profession and are a little farther removed from personal influence.

We hope that the Chairman of the Legislative Committee will have the desired information ready in the near future and that he will communicate the same to the entire medical profession of the state, either directly or through the Officers of the County medical societies. When a member receives this information, he should make the best and most use of the same and exert all the possible influence, hee may have to see that the candidates, who are friendly to the profession are elected and that those who are either non-commital or openly opposed are defeated. The medical profession should be a great political influence on such subjects as this, just as they are a great moral and social influence at all times.

I regret that I do not have an article from the pen of Dr. John Neal on this subject to present at this time. He had partially promised to have one at this time, but undoubtedly the job has been greater than he anticipated and he will communicate to the medical profession either directly or through the county socities. When he does so it is to be hoped that every society and every man in the society will make the election of the proper men his personal responsibility and exert all his influence. Failure to do so may result in election of men, who will succumb to the blandishments of the reformers, who avowedly have a bill ready to pass in the coming session of Congress, which will make the Socialization of the Practice of Medicine a reality and not a peril. Then the opportunity of the medical profession will have passed and wailing will be of no avail. Republican and Democratic Members of the medical profession, forget your partisanship and support those men, who promise to preserve the private practice of medicine.

E. S. Hamilton, M. D.,
Chairman of Committee.

KILLING TWO BIRDS WITH ONE STONE

At the annual meeting of the American Medical Association, San Francisco, the Indiana State Medical Association presented a plan for the performance of public health services in doctors' offices. This was designated as a means of killing *"Two Birds with One Stone"*; the two birds being *Socialized Medicine*, and *Disease and Death*. The plan was approved in principle by action of the House of Delegates, which instructed the Bureau of Health and Public Instruction of the American Medical Association to publicize the plan and call it to the attention of component and constituent societies.

We publish for educational purposes the plan reprinted from the Journal of the A. M. A., July 2, 1938:

INDIANA SUGGESTS A WORKABLE PLAN TO PROTECT THE HEALTH OF THE PEOPLE OF THE UNITED STATES

AN ANTIDOTE FOR STATE MEDICINE

Frequently today the physician finds articles in the press questioning his efficiency and his methods of practice. Such articles accuse him of ignoring preventive medicine in his daily work. He is bewildered and defensive in his attitude, for he feels that he is doing his job well. Even superficial observation will disclose the marked drop in death rate as a result of measures instituted by the medical profession in controlling tuberculosis, malaria, typhoid, diarrhea, yellow fever, puerperal sepsis and other infectious diseases.

Preventive medicine is now being practiced by all physicians as private practitioners to some degree. In many parts of the state, county medical units have a definite program. The time is ripe to correlate these scattered activities, survey our local situations, and acquaint the public with the extent of this phase of our work.

Many phases of preventitve medicine have advanced by stimulation from outside groups. Drives have been sponsored with much misunderstanding. Preventive medicine has now reached its maturity and should be utilized to the fullest by organized medicine and by the individual doctor. It is futile for one county or state to try to promote this alone. Disease and disaster are not aware of state borders. A national policy on the part of organized medicine is needed now.

Too long have we kept our light under a bushel. It is time to take the offensive. The amount of preventive medicine can be increased by the private practitioner with definite benefit to his community and to himself, and the public will be made to realize that American Medicine is pliable enough to continue as an individualistic enterprise.

Throughout the ages, medicine has adapted itself to social changes. We are now in one of those states of changing social customs and aspirations. The American public looks to organized medicine for leadership. Prevention of disease, early recognition of defects and diseases, reduction of hazards and prolongation of life are the important functions of a physician.

In Indiana we have visualized preventive medicine as a wheel with each spoke representing some important phase. Each phase is featured as a "Topic of the Month" in the *Journal of the Indiana State Medical Association* and is announced or discussed in each county medical society the month the subject is featured. The topic of the month is given support in the press and is discussed by speakers before medical and lay groups.

TOPICS OF THE MONTH

January—Formulation of Plan.
February—Syphilis.
March—Pneumonia.
April—Diphtheria.
May—Maternal and Child Health.
June—Crippled Children.
July—Highway Accidents.
August—Occupational Diseases.
September—Annual Physical Examinations and Heart Disease.
October—Conservation of Eyesight.
November—Tuberculosis.
December—Smallpox.

PURPOSE

To promote aggressive leadership by Organized Medicine in Prevention of Disease and early detection of defects.

To incorporate preventive medicine as an important phase of private practice and of county medical activity.

To promote a National Health Program with emphasis on Prevention of Disease sponsored by the American Medical Association with due regard for local situations.

Our modern age demands cooperative efforts by organized medicine to distribute modern medicine.

DIVIDENDS OR RESULTS

1. Create good will and public approval.
2. Raise general standard of medical practice.
3. Prevent many deaths and much suffering.
4. Give a better ordered life for the doctor.
5. Give a steadier income for the doctor.
6. Intelligent defense against disease is our best defense against government encroachment.

ALTERNATIVE

Noisy and aggressive lay groups will seize leadership and we will trail behind, cloaked with heavy governmental supervision.

SYPHILIS

"NO BABY BORN WITH SYPHILIS IN INDIANA BY 1940"

Can be controlled by:

1. Premarital examination including blood test.
2. Blood test early in every pregnancy.
3. Making good treatment available to all.
4. Good laboratory service available to all.
5. Reporting of new cases by name or number to health department.
6. Tracing contacts by trained social investigators.
7. Free distribution of drugs for medically indigent patients.
8. Isolation of infectious, noncooperative cases.
9. Making provision for infectious transient or itinerant.
10. Cooperation of private physicians and public clinics.
11. Developing and popularizing a minimum standard of treatment for early syphilis.
12. Continuing the educational program among medical and lay groups.
13. Helping the Negro solve his syphilis problem.
14. Spinal puncture on every treated case.
15. Spending the syphilis dollar where it counts.

PNEUMONIA

1. Leadership by the medical profession in developing a complete pneumonia program for all the people.
2. Recognition by the physician of the importance of early diagnosis and early treatment of pneumonia and the use of life-saving types of serum.
3. Development of facilities so that typing may be done within four to six hours.
4. Appointment of committees by state and county medical societies for special studies in pneumonia.
5. Adequate nursing care for home cases.
6. Development of adequate hospital facilities.
7. Education of the public as to the gravity of the whole pneumonia problem, and the fact that the common cold often is an antecedent for pneumonia.
8. Education of the public as to what may be expected if pneumonia is properly handled.
9. Formation of serum "banks" in order to supply serum immediately and free to the indigent or on proper credit to those who are solvent but incapacitated.

10. Try to lower the cost of present forms of treatment.

11. Usual well established supportive treatment indicated in addition to serum treatment.

12. Teach the physicians generally the importance of early typing of every suspected pneumonia.

DIPHTHERIA

1. Immunization of every child at 1 year of age by family doctor.

2. Accomplished by following plan:

When child is 1 year of age local health officer sends a double postcard to the parents stating that it is the judgment of organized medicine and health authorities that now is the time to immunize the child against diphtheria and to see the family doctor at once. When the infections have been completed the doctor returns the second half of the card to the health officer.

If immunization of the child is unpractical from the standpoint of (1) finances, (2) moved away, (3) death of child, (4) religious objection of parents, the parents are asked to check and return. The medically indigent are handled according to the customs of the community.

3. When child enters school he receive a Schick test or another injection of toxoid.

No Drives—No Misunderstandings—Constant Pressure.

MATERNAL AND CHILD-HEALTH

"SAFE MATERNITY—HEALTHY CHILDREN"

1. Good antepartum care available to all.
2. Nursing assistance at home deliveries.
3. Continued study of the causes of maternal and infant mortality by organized medicine.
4. Inquiry as to cause of each individual death by the state committee and hospital staff.
5. Immunization program for all children.
6. School health programs—physical health education—distribution of literature on health.
7. County public health nursing program under medical advisory committees of local counties.
8. Mental hygiene program for children.
9. Dental educational and reconstruction program.
10. Postgraduate work for physicians, dentists and nurses.

CRIPPLED CHILDREN

"CORRECT REMEDIAL DEFECTS EARLY"

1. Include in birth certificates the presence or absence of congenital defects.
2. Cooperation of state medical association through advisory committee.
3. Nurses contact physicians, who report cases.
4. Early consultation made available to all.
5. Children treated in approved hospital near home if possible.
6. Schools for crippled children in the larger cities.
7. Reciprocal arrangements between states for transient crippled child.
8. Find and offer aid to the older crippled child.

HIGHWAY ACCIDENTS

1. A study by organized medicine of the causes of death from highway accidents.
2. Assist the law enforcement agencies in reducing the hazards of the careless and drinking driver.
3. Aptitude test on the repeating offenders.
4. Probabtionary period for young drivers.
5. Cooperate with the American Red Cross in first aid instruction.
6. Filling station attendants to be given instruction in first aid.
7. Develop protection for the doctors and hospitals from irresponsible injured.

OCCUPATIONAL DISEASES

Occupational diseases form approximately 2 per cent of the total disability from industrial causes.

1. Assist employers to cope with employees' health problems with cooperative attitude on the part of the medical profession.
2. Preemployment thorough physical examination.
3. Periodic health examination. (If routine blood tests are made on the employees, treat—don't fire.)
4. Majority of occupational diseases are skin infections, many of which are preventable.
5. Patch testing of employees in occupations producing dermatitis will greatly decrease illness.
6. Teamwork of industrial physician and general practitioner is very desirable.
7. Industrial physician should direct patients with diseases other than those resulting from employment into the channels of ordinary practice.
8. Find the job that best fits the employee physically.
9. Use existing hospital facilities as much as possible.

ANNUAL PHYSICAL EXAMINATION AND HEART DISEASE

1. Educate physicians in better recognition of heart disease.
2. Teach the newer methods of studying functional capacity of the heart.
3. Teach the seriousness of "mild" infections as a background for heart crippling.
4. Teach the role of weight, heredity and environment in the production of hypertension.
5. Educate the physician and layman as to the seriousness of rheumatic infections.
6. Continue to emphasize the role played by syphilis in the problem of heart disease.
7. Train heart cripples of all ages in pursuits that permit them to accommodate their defects.
8. Educate physicians and the public in the importance of periodic examinations.
9. Urge the need for careful periodic examinations after middle life.
10. Stress the need for certain laboratory and x-ray studies at regular intervals: urinalysis, serologic, electrocardiographic and similar laboratory procedures.

CONSERVATION OF EYESIGHT

1. Ophthalmia Neonatorum. Prevent by prompt instillation of silver nitrate, 1 per cent or 2 per cent solution, into the eyes of the newborn.

2. Squint or crossed eyes. Begin treatment not later than age 2.
3. Discourage the use of high explosive fireworks in the hands of children. Reduce fourth of July eye injuries.
4. Examination of school children for visual defects.
5. Avoid eyestrain. A. Correct visual defects. B. Prevent and treat diseases of the eye. C. Install proper lighting. D. Reasonable use of the eyes according to effects of use.
6. Help reduce hazards from industrial accidents.
7. Early detection and treatment of syphilis will reduce blindness.
8. Wipe out trachoma in Indiana.

TUBERCULOSIS

1. Physical examination of every child at age 16, including tuberculin test.
2. Thorough physical examination on entering college or industry.
3. Examination of all nurses on entering training and recheck at regular intervals.
4. X-ray available for positive reactors.
5. Trace contacts and examine.
6. Protect the community from infectious cases by adequate number of hospital beds.
7. Concentration on detection of early cases.
8. Cooperation with antituberculosis association and public health nursing organizations.
9. Continue educational program in high schools.
10. Use collapse therapy when indicated.
11. Rehabilitation program.

SMALLPOX

1. Vaccinate every child at age of 1 year after completion of diphtheria immunization.
2. Vaccinate again on entering grade school and thereafter at regular intervals by the family doctor.

Extend the scope of preventive medicine to include other infectious diseases and metabolic disturbances as methods are proved to control them.

THE INDIVIDUAL'S MEDICAL SERVICE CHART THROUGH LIFE

Three Months Pregnant	
Measurement of pelvis	Reduction in maternal mortality
Blood pressure—urine	Prevention of congenital
Wassermann test	syphilis
At Birth	
Silver nitrate in baby's eyes	Prevention of blindness (ophthalmia neonatorum)
First Week	
Physical examination of baby	Recognition and correction of remedial defects
First Year	
Correct infant feeding	Prevention of diarrhea-rickets and scurvy
One Year of Age	
Immunization and vaccination	Prevention of diphtheria and smallpox
Two to Fifteen	
Annual check-up by the family physician	Individual health education
Sixteen Years	
Physical examination with special attention to lungs	Prevention and early recognition of tuberculosis
Before Marriage	
Premarital examination	Recognition of venereal diseases
Adult Life	
Annual physical examination	Prevention of heart disease

Reduction in Hazards

1. Venereal disease control
2. Pneumonia control
3. Highway accidents
4. Typhoid
5. Nervous disorders
6. Occupational disease
7. Cancer

Bureau of Publicity
Indiana State Medical Association
1021 Hume-Mansur Building
Indianapolis, Indiana

THE RELATION BETWEEN PHYSICIANS AND HOSPITALS

The report of the committee "Relation of Physicians to Hospitals (I. H. Neece chairman) presented to the council of the Illinois State Medical Society at its meeting in Chicago, September 4th, was approved and ordered published. The report is as follows:

At this time when the medical profession is much concerned with the attempts of lay groups, cooperatives, insurance companies, associations, corporations and governmental agencies to take over various phases of the practice of medicine, the House of Delegates of the Illinois State Medical Society moves the adoption of the following principles to prevent similar relations between hospitals and physicians which are not in the best interests of public welfare.

"A. Community hospitals are civic enterprises, having a primary charitable motive, undertaken by philanthropic laymen who assume the financial obligation of providing place, equipment and personnel, and by philanthropic physicians who assume the obligation of providing medical care. Such a hospital is a joint enterprise to render aid to ill, indigent persons; the lay supporters contributing time and money as such, the medical supporters contributing time and money in the form of professional service.

"B. In order to provide hospitalization for the non-indigent such hospitals customarily maintain accommodation for the care of full-pay patients, as well as for the care of partial-pay patients, who pay for this service according to their ability.

"C. In any of these types of hospitalization, however, the hospital as a corporation provides room, board, nursing and material, beyond which it has nothing to dispose of; at this point the medical staff enters the equation as the essential element to make the service of the hospital whole and effective.

"D. The staff physicians' services are essential to the charitable purpose of the hospital and the acceptance of his appointment has a certain contract implication, viz., to perform gratuitously the professional service to make effective the hospitalization afforded gratuitously by the institution. A correlative implicaton of the contract should be that if the institution is recompensed for its service to the patient, the physician should be entitled to recompense in the same proportion, for if the hospital owes it to the supporting public to make the load of charity as light as possible, it owes the same duty to its supporting staff. Otherwise, the effect is that the lay supporters of the hospital are relieved of part of their burden, whereas the medical supporters bear the entire burden of their contribution.

"E. This contribution to the hospital enterprise is not offset by any advantage offered by the hospital connection to the staff physician. If it be said that the hospital lends prestige to the staff, it is much more true that the prestige of the hospital depends upon that of its staff.

"F. Hospitals should realize that the profession, through its central organization, the American Medical Association, has evolved certain "principles of medical ethics," outlining the duties of physicians to each other, to the profession at large and to the general public; that this code is the evolution of hundreds of years experience being based on principles that are primarily for the good of the public in order that the profession can serve it most effectively. Since the profession is bound by these principles, hospital boards should study them carefully in order to better realize the physician's viewpoint. (While hospitals have no general code of ethics, those prescribed for physicians have generally been interpreted as applying to hospitals. The connection between medical ethics and hospitals is also recognized in codes of ethics for state hospitals is also recogand in the code of ethics for hospital publicity of the American Hospital Association.) This should enable hospitals to correlate their service more adequately to cooperate with the profession to render better service to the public. One section of the "principles of medical ethics" with which many hospital boards are apparently unacquainted states (Article 6, Section 4):

"It is unprofessional for a physician to dispose of his professional attainments or services to any lay body, organization, group or individual, by whatever name called, or however, organized, under terms or conditions which permit a direct profit from the fees, salary or compensation received to accrue to the lay body or individual employing him. Such a procedure is beneath the dignity of professional practice, is unfair competition with the profession at large, is harmful alike to the professon of medicine and the welfare of the people, and is against sound public policy.

"G. Hospitals being corporations, their management and policies are the proper prerogatives of their boards of directors. The organization of such boards commonly has overlooked the fact that there are two necessary factors,—the services of laymen, as well as the services of physicians, to make the institution effective and the medical staff has usually not been represented. Failure to have the medical staff represented on the board of directors of hospitals has occasioned two undesirable results: (1) the appearance of policies prejudicial to the medical profession, because the influence and information obtainable from medical members has not been available; and (2) the development of the idea that the staff members are servants of the institution rather than essential partners.

"H. It follows that the medical profession to protect its rights, should insist upon proper representation on hospital boards and that hospitals recognize the profession as partners rather than servants of the institution. (It is suggested that not less than two members of the hospital staff, preferably chosen by the staff itself, serve on the hospital board.)

In view of the above stated principles the following recommendations are made:

1. That no hospital shall be permitted to engage in any form of contract practice with an individual, or group of individuals, for any purpose other than the use of physical facilities, materials, and non-medical services such as room and board, use of the operating and delivery rooms, drugs and medicines, surgical dressings, appliances and general nursing care.

2. That no hospital shall offer, for a price, any medical service.

3. That in no case may a hospital charge a patient for other than the use of its physical facilities, materials and non-medical services.

4. That emergency and accident patients may have first aid only, administered at the hospital, and the physician selected by the patient must be immediately notified. In no case shall a patient, able to pay, be admitted to the service of a staff member without the request of the patient's own physician, if there be one.

5. That patients who are covered by compensation, health or accident insurance, cannot be considered as indigent.

6. That none but strictly indigent patients shall be admitted to dispensaries.

7. That no patient, except in emergency, shall be admitted to a dispensary without a letter from a physician, to be followed by adequate investigation by the social worker to the hospital, who shall be able to certify that the patient is known to be indigent.

8. That patients who have been discharged shall not later be re-admitted to a dispensary, without certification by a physician that his present economic condition is the same as on his previous admission.

9. That a committee be appointed by the Council of the Illinois State Medical Society, to meet with a Committee of the Illinois Hospital Association for the purpose of creating a standing council to encourage and facilitate the application of these principles, to further codify relations between physicians and hospitals, and to act as a Board of Review in considering violations of these principles by hospitals and physicians.

AMERICAN BOARD OF OBSTETRICS AND GYNECOLOGY, INC.

The next examinations (written and review of case histories) for Group B candidates will be held in various cities of the United States and Canada on Saturday, November 5, 1938, at 2:00 P. M., and on Saturday, February 4, 1939. Application for admission to the written examination scheduled for February 4, 1939, must be filed on an official application form in the office of the Secretary at least sixty days prior to this date (or before December 4, 1938).

The general oral, clinical and pathological examinations for all candidates (Groups A and B) will be conducted by the entire Board, meeting in St. Louis, Missouri, May 15 and 16, immediately prior to the annual meeting of the American Medical Association. Application for admission to Group A examinations must be on file in the Secretary's Office before April 1, 1939.

For further information and application blanks, address Dr. Paul Titus, Secretary, 1015 Highland Bldg., Pittsburgh (6) Pa.

AMERICAN ASSOCIATION FOR THE STUDY OF GOITER

The annual meeting of the American Association for the Study of Goiter for this year will be held in Washington, D. C., September 12, 13 and 14 in conjunction with the Third International Goiter Conference. A final program will be available at the time of the meeting and will be distributed to all attending physicians at the registration desk on the morning of September 12.

Very truly yours,
W. Blair Mosser,
Corresponding Secretary,
Kane, Pa.

NOTICE

A prize of value £10/—will be awarded to the contributor of an approved thesis on "Venereal Diseases." The thesis should be in English. The entry fee in this competition is only 4 shillings. Entry fee must be sent by money-order or postal orders. There is no territorial bar for the competitors. The result will be sent to every competitor. The thesis will be judged by a board of Examiners and the decision of the Board will be final on all matters. The thesis should reach the Editor—The Punjab Medical Journal, Banga, (Punjab-India), by registered post on or before 30th December 1938. The Editor has a right to publish the thesis received.

W. Capon,
Banga, (Punjab-India), Editor.
Dated 25th July 1938. The Punjab Medical Journal.

H. L. MENCKEN COMMENTS ON MEDICINE UNDER THE NEW DEAL

H. L. Mencken in the *Sun*, Baltimore, Sunday, August 21, 1938, under the title "Medcine Under the New Deal," comments quite learnedly, we quote:

The project of the New Deal Kremlin to liquidate the American Medical Association under the Sherman Act appeared at first glance to be only an elephantine sort of practical joke, and in that character I discussed it lightly in the *Sunpaper* of August 5. But in a little while news came from Washington that the boys really proposed to go through with the show, and on August 13 a talented New Deal professor, Dr. Walton Hale Hamilton, was assigned to set me right about it and put me in my place.

I have read Dr. Hamilton's exposition in an humble spirit, but can only report that it leaves me profoundly unimpressed. It is smart but not adroit; voluptuous but not persuasive. Its substance is contained in the following paragraph:

"The technology of medicine has made its great advances by trial and error; the arrangements under which patients have access to medical services must be kept subject to a like revision. It is silly to encourage experimentation in the medical laboratory and to forbid it in the realm of medical economics."

Well, what does this mean? If it means anything at all, it means that the American Medical Association is opposed to all such experimentation, and is trying by some means or other to stop it. Is there any truth in that allegation? There is no truth in it whatsoever.

The plain and simple truth is that the *Journal* of the association, for eight or ten years past, has given over a large part of its space to the description and discussion of new "arrangements" of medical practice, and that more than one of these "arrangements" has been passed as unobjectionable, and is being tested at this very moment by members of the association in the highest standing.

I point, as a near and obvious example, to the scheme of the Associated Health Service of Baltimore. That organization, which now has nearly 25,000 members, is not only tolerated by the local bigwigs of the A. M. A., but was actually launched and underwritten by some of them. All of the Class A hospitals of Baltimore, absolutely without exception, have agreed to accept subscribers to the service as patients, and all or nearly all of them contributed to the funds needed to set it going. Two of its directors are Dr. Winford H. Smith, director of the Johns Hopkins Hospital, and Dr. Arthur J. Lomas, director of the University Hospital, and not a few of the staff doctors of both hospitals have joined it as members, and brought in their wives and children.

The reasons for this tolerance are not far to seek. They lie in the plain and simple fact that the Health Service does not undertake to practice medicine, but simply provides its members with hospital care and accommodation. Every one of them is free to choose his own doctor, and any doctor may be chosen who has the privilege of taking patients to any Baltimore hospital. There is no intervention between doctor and patient. There is no shading or conditioning of the doctor's professional dignity and independence.

The "arrangements" to which the American Medical Association objects, and quite properly objects, are entirely different. They not only offer hospital accommodation, but also medical service. They employ doctors, organize them into staffs, put them under superiors (some medical, but others lay), and hire them out to subscribers. Whatever the subscribers pay for their services goes, not to the doctors, but to the organization. It pays them whatever they are willing to work for, and keeps the rest.

Obviously, no doctor who works under such conditions can be said to maintain a strictly professional status. He may have a good job; he may like it, and he may give competent and conscientious service to the patients assigned to him, but in the last analysis they are the association's patients, not his. It may take them away from him at will, and assign him others. It may take them all away from him by dismissing him. They exist as his patients only by the association's grace, and on conditions that it lays down.

Certainly the lawyers in the Department of Justice must be well aware that an analagous effort to invade and deprofessionalize their own profession has been

under way for years and that nearly all the decent lawyers in America have opposed it violently and gone into court time and again to prevent it. All the objections that these decent lawyers have brought against the practice of law by corporations are valid against the practice of medicine by corporations. Both schemes, however artfully they may be disguised, involve the organization of professional men into gangs bossed by laymen and the retailing of their services to all comers. Both are completely destructive of their professional status.

The present disingenuous assault upon the American Medical Association did not originate in the Department of Justice. It originated in quite other quarters and has been going on for a long while. There are doctors who aspire to office in the association, with all the honors and dignities thereto appertaining, but do not seem to be able to get the necessary votes; they appear to believe that their chances would be better under some sort of medical new deal. And there are quacks who have felt the association's heavy hand they are against it on all counts and to the death.

Both these parties have been on the warpath for years. Of late they have been joined by a miscellaneous rabble of pinks, some of them outright converts to the Moscow hooey and others members of the "I'm Not a Communist—But" Association. The aim of these brethren is to nationalize the profession of medicine in the United States as it has been nationalized in Russia. Some of them say so frankly, and undertake to prove idiotically that the Russian system is better than the American. The rest, less honest, root for it without openly advocating it.

All the pink weeklies and other manic-depressive sheets are hot against the A. M. A. and belabor it constantly. They denounce it under the name of the medical trust, and allege that its members are racketeers who rob their patients and oppress the poor. The justice and decency of these charges may be indicated by putting them into concrete terms. What they allege, in plain English, is that such men as Dr. Thomas S. Cullen, Dr. Dean Lewis and Dr. John T. Finney are racketeers, and that scores of able and faithful men and women who labor in the Johns Hopkins and University of Maryland dispensaries every day are oppressors of the poor.

The chief butt of all such scurvy liars is Dr. Morris Fishbein, editor of the *Journal of American Medical Association*. In the fulminations of the pink weeklies he is commonly promoted to the presidency of the association and depicted as its Stalin, Hitler and Mussolini. I happen to be well acquainted with Dr. Fishbein, and may be presumed to have some qualification for judging him as an editor. It is my belief that no abler, more honest, more intelligent or more courageous editor is in practice in the United States. Week after week, year after year, he produces an unfailingly competent and valuable paper.

In all the history of American medicine, no other medical editor save his predecessor and mentor, Dr. George H. Simmons, has labored more valiantly and effectively to raise and safeguard the standards of the profession. He has been in the forefront of every effort, by whomsoever initiated, to put down buncombe and quackery and to promote sound medicine. Every improvement that has been made in his time, whether in professional education, in hospital service, in research and experiment, or in the bettering of relations between doctors and the public, has had his energetic support.

The quacks of all schools are naturally against him. The osteopaths and the chiropractors, the patent medicine harpies and the Christian Scientists have been banging away at him for years. Now they have got the support of the New Deal. It is a logical and legitimate alliance.

WHAT IS THE ISSUE?

At the September meeting of the council of the Illinoin State Medical Society, Dr. I. H. Neece, chairman on the committee on Relations of Physicians to Hospitals, presented a resume of an article of the same title by Mac F. Cahal, International Society Committee for Radiology. The article should be read by every member of the Illinois State Medical Society. The report was approved and ordered published. We quote:

For a number of years there has existed a controversy, which occasionally and in certain communities has flared into warlike proportions, between organized hospitals and the organized medical profession concerning the practice of medicine in hospitals. Particular interest has centered around the specialties of radiology, pathology, anesthesiology, physical therapy, and others which are closely identified with the treatment of patients during hospitalized illness.

During recent years the question has been brought to a head by the advent of hospital insurance and by the determination on the part of some hospital administrators, met by decreasing endowment income, to reap a "middleman's" profit from fees paid for medical services performed in the hospital. To make hospital insurance more saleable they have demanded that certain medical services be included in the benefits offered by the hospital. To secure needed revenue they have employed specialists on a salary or commission basis, sufficiently low to permit, in some cases, a handsome net income to the hospital after all expenses are paid.

Organized medicine has steadfastly insisted that the quality and the future of medical care will suffer if private practice is supplanted by institutionalized practice, delivered, sold, and controlled by a third party corporation, hospital or otherwise. Medical practice, says the profession, belongs to doctors, and the physician's relation to his patients must not be complicated by a corporate distributing agency. Hospitals they say, are institutions where doctors may treat the sick, retaining the same professional relationship with the patient that they have in the home or private office.

The American Hospital Association, representing the organized hospital world, has, with a good deal of emphasis, expressed an opposite view. The hospital, they

say, is more than a place where doctors treat their patients. It is an institution which provides not only facilities but medical service. In this day of corporate structure and mass production, the hospitals say their function includes the provision of certain medical services through the medium of employed physicians under salary or commission contracts.

With diametric "principles" promulgated by first one side and then the other, and with prejudiced opinion presented as legal and ethical fact, it seems desirable that certain definitions be drawn and certain statements examined. The issues should be frankly and clearly stated.

The medical profession recognizes that improvements in hospital facilities and administration have been partly responsible for the tremendous strides of medical science and the high quality of medical care enjoyed by the American people today. Hospital administrators are no less approbrious in their praise of the physician for his humanitarian contributions to the public welfare.

The differences arise in the question of economics. The medical profession demands that the hospital meet its financial obligations with revenues from its endowments, its income from charities, and its profits on the rental of its rooms and facilities, and the sale of its *hospital* services. It denies the hospital's right to earn a profit from the sale of physicians' services.

And there is the issue. The American Hospital Association insists that the hospital has a right to provide certain medical services, along with its hospital facilities. Says the Board of Trustees of the A. H. A. "Provision of medical services in hospitals is part of the responsibility of the hospital." W. P. Slover, a hospital superintendent, writing in the Journal of the A. H. A.,[1] advises hospitals to increase their revenue by educating the public to "more regular use of the laboratory, the x-ray and diagnostic services for systematic check-ups on their health." That this places the hospital corporation in competition with private physicians is no concern of the author's. Editorially, the same Journal,[2] declares that, "Diagnosis, treatment, and care of the ambulatory sick become increasingly the function of the hospital, as the hospital develops into the centre of community health activities."

It is well recognized that corporations, being artificial legal entities, cannot be licensed and are therefore not permitted to practice medicine. Among hospitals there is a widespread belief, presented as legal fact, that incorporated hospitals do not fall under this category. Says their official Journal,[3] "The laws regulating the practice of medicine by corporations do not apply and were never intended to apply to hospitals." No authority for the statement is cited. The Board of Trustees of the A. H. A.[4] is slightly contradictory when it attempts to justify corporate practice by declaring that it isn't corporate practice. "The performance of diagnostic and therapeutic procedures by staff members constitutes the practice of medicine *in* hospitals. It is not the practice of medicine *by* hospitals," they say. Presumably this would be true even if such practice *in* the hospital enabled the hospital to secure a nice fat income. Offering a "principle" again as a fact, the Board states that, "The financial arrangement between a hospital and a physician is not a determining factor in the ethics or legality of medical practice" by physicians practicing in the hospital are not engaging in such practice. Says the hospitals.

Furthermore according to the hospitals, even if these two rationalities are disproven, radiology, pathology, and certain other specialties are not the practice of medicine but are part of hospital care. Apparently the hospitals are not too sure of their ground, else they would not find it necessary to provide three premises for the same syllogism. Hospitals which practice medicine for a profit do not practice medicine; anyway laws prohibiting corporate practice do not apply to hospitals; and if these both be untrue, the services under question are not medical services but are hospital services.

"At what point can a line be drawn, if anywhere, between 'hospital' service and 'medical' service?" asks Michael Davis, a member of the Council of the A. H. A.,[5] implying that the one is the other. As a matter of fact the question is not so difficult as the above author would make it appear. The terms are properly used—one is hospital and one is medical. Numerous court decisions have defined the terms and according to Bouvier's Law Dictionary,[6] "The primary meaning of the terms medical attendance or medical services is the rendering of professional medical services." The Supreme Judicial Court of Massachusetts has held that,[7] " . . . While the term 'medical services,' if used without limitation, may be susceptible of a broad construction, the statutes cited clearly indicate that those words, as therein used, are restricted to medical assistance rendered by the physician or under his direction and control."

Physicians have delegated certain medical functions to be performed by nurses, interns, and other employees of the hospital under their direction, but these functions are performed by the hospital corporation through the sufference and under the authority of physicians. It does not confer upon hospitals the right to indulge in the practice of medicine by themselves in disregard of the preference of physicians. Doctors can exist without hospitals but hospitals cease to become hospitals without doctors.

It is likewise true that the courts are well agreed that corporations cannot practice medicine and that this applies to hospital corporations. In Granger v. Adson[8] the Minnesota Supreme Court reasoned that inasmuch as a corporation or a layman could not practice law by employing a licensed attorney, for the profit of the corporation or layman employing him, to act as attorney or counsel for others, it was improper and contrary to statue and public policy for a corporation or layman to practice medicine in a similar way. Simi-

1. HOSPITALS, June, 1938, p. 50.
2. HOSPITALS, May, 1937, p. 73.
3. HOSPITALS, June, 1938, p. 65.
4. In a statement adopted June 18, 1938.
5. THE MODERN HOSPITAL, July, 1938, p. 57.
6. Baldwin's Century Edition, p. 795.
7. People v. Pierson, 176 N. Y. 201.
8. Granger v. Adson, et al. Minn. 250 N. W. 722.

lar decisions have been rendered by courts in many other states.

When the editors of the Journal of the A. H. A. make the statement that, "The laws regulating the practice of medicine by corporations do not apply and were never intended to apply to hospitals,"[9] they are, to resort to useful vernacular, talking through their hat. This and a number of other statements emanating from hospital headquarters are rather convincingly refuted in a recent opinion by Judge J. F. Bouchelle of West Virginia.[10]

After citing considerable authority to support his opinion that a hospital corporation could not practice medicine, the Court concluded by saying, "In order that there be no misunderstanding as to the scope of this opinion, attention is directed to the fact that it is not intended to preclude contracts by individuals or corporations to furnish *hospital facilities* only. . . . Neither is it intended to prevent medical attention gratuitously contributed by doctors and surgeons to patients of incorporated charitable organizations." This last should help worried Mr. Davis to answer the rhetorical questions contained in his recent article in *The Modern Hospital*.[11] He should be interested also in the legal definitions cited above.

For reasons of brevity it is impossible to quote the many court decisions or the statutory law bearing upon all the points raised in recent official statements by organized hospitals. Suffice it is to say here that there is ample authority to disprove many of their contentions, granting at the same time that the courts are by no means completely agreed on some points.

By a rather vitriolic exception to certain principles adopted at the San Francisco session of the American Medical Association, organized hospitals have clearly defined the issue. Organized medicine wants the practice of medicine to be left to private physicians—organized hospitals demand that they be privileged to take over certain specialties to be sold at a profit by the corporation. Especially are they insistent that in hospital insurance plans, they be allowed to include certain medical services as benefits along with their hospital services. Medicine denies them this right, on the grounds that it alters the professional status of the physician and is contrary to public policy.

The Philadelphia County Medical Society went to court to enjoin local hospitals from proceeding with such a plan against the expressed desires of the profession. After several days of testimony before the Master, the attorneys for the hospitals agreed to accede to the demands of the county society and the suit was withdrawn. Doctors who testified made it clear that they objected, not to insurance which paid cash benefits for medical services, but to the inclusion of these services as benefits in kind to be offered as a part of hospitalization. The victory in Philadelphia sets a valuable precedent and should serve as a lesson to hospital groups who may get the mistaken idea that they are authorized to determine the methods by which doctors shall practice their profession.

As for radiologists, pathologists, anesthetists, and others whose specialties are most coveted by the hospitals, they hold to the same philosophy and ethical principles as does all organized medicine. While it is undeniably true that contractual relations between practitioners of these specialties and their hospitals have placed many of these physicians in the position of an employee of the hospital corporation, the fact remains that theirs is a medical service and not a hospital service. Radiologists, for instance, have permitted hospitals to collect their fees, receiving in reimbursement a salary or commission, for the simple reason that it offered an accounting convenience. Never have they relinquished their professional rights as physicians and never have they agreed that they were performing a hospital service instead of a medical service. The science of radiology belongs to radiologists, not to hospital corporations directed by a lay board of trustees. Regardless of the fiscal arrangement under which a radiologist practices his profession in the hospital, he denies the hospital a right to profit from his practice or to sell his services on an annual premium basis to groups of insurance subscribers. The hospital is entitled to retain a portion of radiologic fees sufficient to repay it for its costs in maintaining a department where patients can be treated and where the doctor may treat them, but it has no moral, legal, or ethical right to demand a net profit from professional services rendered by members of the staff in the hospital.

In a recent article in the Journal of the A. H. A.[12] S. S. Goldwater falls back on an old and ingenious method of evading the profit issue. Inasmuch as hospitals are non-profit corporations, says the learned doctor, it cannot be said to be practicing medicine for a profit when "organizing, participating in, and facilitating the business transaction" incidental to medical practice. Of course hospitals lose money; that is their purpose and function. But when they engage in the hospital business at a loss, that gives them no right to engage in the practice of medicine at a profit to lessen the burden of their charity. Doctors are not subsidized by philanthropy—hospitals are. Doctor Goldwater goes further to echo the statement of numerous other hospital executives when he remarks that the practice of medicine by hospitals results in reduced costs to the patient. It is hard to understand how the interjection of a third party, obviously concerned with a profit for itself, will reduce the cost of medical care below what it would be if the transaction took place between the doctor and his patient.

Here then is the issue. It has been clearly, if perhaps unwittingly, stated by organized hospitals. Without evidencing the customary obsequiousness of a suitor, they are proposing marriage, and if their proposal is spurned they have let it be known that they intend to force the issue. With equal forcefulness, and not in the least flattered by the proposal that they sacrifice the freedom of celibacy, practitioners of medical specialties have let it be known that they are not interested in such a marriage, especially when it en-

9. op. cit.

10. Amick v. Staats Hospital, in the circuit court of Kanawhat County, W. Va.

11. op. cit.

12. HOSPITALS, July, 1938, p. 11.

tails division of their income with an impecunious spouse.

ILLINOIS STATE MEDICAL SOCIETY

COUNTIES WITH 100% PAID UP MEMBERSHIP FOR 1938

Adams	Jasper
Alexander	Jefferson-Hamilton
Bond	JoDaviess
Boone	Johnson
Clark	Marion
Clay	Monroe
Clinton	Piatt
Coles	Richland
Cumberland	Schuyler
Crawford	Shelby
DeKalb	Stephenson
Douglas	Tazewell
Edwards	Vermilion
Effingham	Washington
Fayette	Wayne
Henderson	Woodford
Henry	

WOMAN'S AUXILIARY TO THE ILLINOIS STATE MEDICAL SOCIETY

A MESSAGE FROM THE PRESIDENT, MRS. WILLIAM RAIM

At the beginning of this new year for the Woman's Auxiliary to the Illinois State Medical Society I wish to extend greetings to members of the Auxiliary and, also, to all physicians' wives, whom we would like to count as members of our organization before the end of the year. The hope of the officers each year is to go forward and to add to the good work and accomplishments of past workers. As in the past this can only be done with the loyal support of every member of the Auxiliary. The officers and chairmen can formulate plans and outline the work, but without the cooperation of the members we cannot gain the results which we so heartily desire. When we realize that we are not a social group, but are organized for a definite promotional purpose we can readily understand the importance of this individual effort.

Heretofore, we have had as our definite aims Hygeia, legislative and public relations work. Last year a new project was added, the Benevolence Fund. This is just in its infancy, but the chairman is putting forth her best efforts and we hope to see this new project in workable order in the near future.

In my letter to the county presidents I urged them to formulate study groups in compliance with a resolution which was adopted at the National Convention in San Francisco. Here again you, as individuals, are needed to make this a 100 per cent success.

Another suggestion to the county presidents was to plan a regional meeting. Such a meeting would be a great source of inspiration and, if planned, I think you will find it very worthwhile to attend.

Plan to attend each meeting and provide a stimulus for bigger and better programs. In return you will be repaid by knowledge gained and the good fellowship of other physicians' wives.

(MRS. WILLIAM) HELEN RAIM,
President.

DR. KARL A. MEYER A CANDIDATE FOR MEMBER OF THE BOARD OF TRUSTEES, UNIVERSITY OF ILLINOIS

Dr. Karl A. Meyer, an alumnus of the University of Illinois, is a candidate for member of the Board of Trustees of his alma mater.

Dr. Meyer has served six years as member of the board of trustees and has received the endorsement of the alumni of the State University.

There are many medical problems that come before the board of trustees of the University and it is therefor well to have a medical man familiar with the problems of the medical profession represented in that august body. Dr. Meyer is the only physician nominated for this high office.

Dr. Meyer is a member of the Chicago and Illinois State Medical Societies and medical superintendent of the Cook County Hospital, he is also associate professor of surgery at Northwestern University.

THEY WENT TO THE MAYOS

In the *Voice of the People, Chicago Tribune,* September 20, appeared the following which is consistent and very much to the point.

Hammond, Ind. Sept. 16.—The article about the doctors in this morning's paper makes me wonder about socialized medicine and why this present administration wants it. Not long ago you published an article about the American Medical Association and a clinic in Washington. If there are competent physicians and surgeons on the staff of this clinic why should James Roosevelt go to the world renowed Mayo clinic, or don't the President and his family have confidence in the clinic in Washington? What is good for one is good for all. Let the government leave the medical profession alone and we will be all the better for it. It is the greatest profession next to the ministry.

Mrs. A. V. C.

ANNUAL MEETING INTERNATIONAL COLLEGE OF SURGEONS

The second annual assembly of the United States chapter of International College of Surgeons will be held at Philadelphia, Pa., October 13-14, 1938.

For full information address: Charles H. Arnold, M. D., Terminal Bldg., Lincoln, Neb.

DO YOU KNOW—

That diphtheria and smallpox which together caused the loss of half a million days from school are easily prevented by inoculation? Every child ought to be protected against these two diseases prior to entering school. This is the parents' responsibility! Such protection not only safeguards that child but all other children with whom he comes in contact.

Diabetes is a more common cause of death in the United States than in any other nation, a record which is blamed in part on rich food, lack of exercise, and nervous tension of life.

Original Articles

INTUSSUSCEPTION

PHILIP ROSENBLUM, M. D.
CHICAGO

Intussusception is essentially a pediatric disease and by far the commonest cause of intestinal obstruction in infants. It is one of the few diseases of childhood in which a few hours' delay in diagnosis may influence the prognosis so much. Once the diagnosis is made, the treatment, for all practical purposes, is usually surgical.

Intussusception may be ileocolic, ileo-ileal, ileocecal and colocolic, depending on the point of origin and the distance the intussusception has advanced. Probably many are ileo ileocolic, that is, starting in the ileum, and the terminal portion of the ileum passing into the cecum from a second leading point. Ascending, or retrograde intussusception occurs, probably, only just before death or at the time of death.

At Cook County Children's Hospital in the years 1935 to 1937 inclusive there were 23,500 admissions from all causes; of these 33 were intussusceptions—about one-eighth of one per cent. Of about 9,000 admissions to the Sarah Morris Children's Hospital in the last five and one-half years, 30 were intussusceptions—about one-third of one per cent.

The etiology of intussusception is not definitely known. The majority of cases occur in well-nourished infants; 75% under one year, males predominating more than two to one. In our series males predominated two and one-half to one.

A history of preceding intestinal disturbance or dietetic error was noted in only about 5% of the patients. In a very small group intestinal tumors such as cysts, Meckel's diverticula, neoplasms, worms, congenital bands or foreign bodies, or a tonsillectomy 48 hours before were noted; but in the majority of the cases there is usually no satisfactory cause to be found. No doubt, the production of intussusception is brought about by several factors. When one considers the rather bizarre movements and the length of the intestines, one realizes that the right mechanics must present themselves at the right time. Just as one may fall several feet and sustain no broken bones, yet, when the mechanics are right one may step from a curb six or eight inches high and break a leg or an arm; similar factors probably operate in intussusceptions. Certainly some basic factors are in operation because in a very small percentage intussusception occurs more than once in the same individual, and very rarely there is a history of more than one case in a family. However, I recall one family in which the diagnosis in one case did not surprise the mother because an older boy had also had an intusssusception. This same boy had a recurrence two years after his first operation.

It is known that the ileocecal valve in infants projects about three-eighths of an inch into the cecum and the terminal portion of the ileum is surrounded by a rich lymphatic supply. Due to various factors these structures become swollen; the projecting valve acts as an irritant and peristalsis increases. In the majority there is no satisfactory etiology. When intussusception occurs in older children some *intra-intestinal affection such as neoplasm, cysts, Meckel's diverticulum,* etc., must be looked for.

The local pathologic changes in intussusception are considerably different from those in other cases of acute intestinal obstruction. The original changes beginning as edema and extravasation of the blood may soon pass into necrosis and gangrene. The swelling is most marked at the apex and along the convexity of the intussusception. There is increased permeability of the intestinal wall to bacteria. Gangrene is much more likely to occur and occurs much earlier in the intussusceptum than in the intussuscepiens.

The *symptomatology* of intussusception is divided into acute, subacute and chronic varieties.

Varieties: The *acute* form is the most common and the symptoms are quite typical. The majority are in infants under two years of age, 75% under nine months. They usually occur in a perfectly healthy, well-nourished baby. The following story is typical of this group, and occurred in an infant that lived just across the street from me some years ago: The mother was holding her seven-month old baby (male) in her arms playing with it, and the baby was quite happy. All of a sudden he cried out, turned pale and drew up his legs. I was called immediately and found the child pale, his skin cold and rather clammy; the patient was in semi-

Read before Joint Session with Sections on Medicine, Surgery and Radiology, Illinois State Medical Society, Springfield, May 18, 1938.

shock. While I was examining the baby he vomited. Every few minutes he would cry out and draw up his legs. His temperature was subnormal. Palpation of the abdomen, which was soft (and usually is when seen early), disclosed a sausage-shaped mass in the right middle portion a little above the umbilicus and extending upward toward the left. This seemed tender when touched. However, tenderness is not a constant finding. Rectal examination disclosed feces in the rectum (this should not mislead the physician, as there is often feces below the intussusception), but the tip of the finger, on removal, showed a little blood-tinged mucus. With this classical syndrome one should never be in doubt as to the diagnosis. A barium enema carefully given may be used to confirm the diagnosis. However, this is seldom necessary in the acute form.

There is very seldom a history of preceding intestinal disturbance or other illness in acute intussusception. Not all cases, however, are of the same severity and one point that I wish to emphasize is that 10% do not show any blood either on digital examination or after an enema. I do not think this point is sufficiently appreciated by physicians, including pediatricians. Very rarely there may be no vomiting. The temperature is usually subnormal or normal when seen early. After the first 24 hours, depending on the severity, dehydration and complications, the temperature rises. Some feel that the prognosis is in proportion to the temperature; that is, a child seen first with 103 or 104 temperature offers a very poor prognosis, but this is not always true as infants may have fever from dehydration. This happened last February: A baby nine months old with acute intussusception, sick three days, 103 temperature; when operated on, the intestine was in good condition and the patient made an uneventful recovery. One thing to remember is that the symptoms may subside temporarily and the patient lie quietly in shock or semi-shock. Occasionally the patient's appearance belies the seriousness of the condition. This was brought out in a child admitted to the Cook County Hospital whom I saw with an intussusception protruding from the rectum, who did not appear very sick.

The white blood count varies from 8,000 to 12,000-14,000 in uncomplicated cases. X-ray with barium enema in the typical case is not necessary as a rule, but when in doubt is very helpful if carefully done. The difficulties of giving some babies a successful barium enema is appreciated when one has tried it himself. They often expel it as fast as it is given. The characteristic "U" shape barium picture is present. This shadow is produced by a small amount of the barium passing for a longer or shorter distance between the intussusceptum and the intussuscepiens. The shadow made by the thin layer is greatly different than that made by the dense mass of barium, so that the end of the column appears to be concave or "U" shaped. This was first demonstrated in a case of intussusception by Dr. F. X. Walls.[1] The ileocecal region is the most common location for the occurrence of intussusception; and it is fortunate that this region is readily accessible to roentgen rays.

In the subacute and chronic cases with partial obstruction the combination of a barium meal and a barium enema may be used. The barium meal will show an apparently markedly narrowed ascending colon. This is, in reality, the ileum invaginated in the colon. When the barium enema is then given, the colon itself will fill and the disproportion of the findings by enema and by barium meal will be the clue to the diagnosis.

Warning, too, must be given that as everywhere else in medicine, negative roentgen ray findings should not be accepted in the face of definite positive clinical signs, as patients have been operated on after a negative report and intussusception found.

In the *subacute* variety, that is, those cases that have symptoms for several days or a few weeks, the onset isn't as severe; the patient isn't in shock as a rule; also this type is more likely to occur in children more than one year of age. These cases are characterized by intermittent attacks of colicky pain associated with vomiting, usually constipation, occasionally small mucus stools, temperature normal or only slightly elevated. These patients groan in their sleep or are restless, due to pain. Palpation of the abdomen discloses a tumor mass usually at the middle of the abdomen extending to the left. Of course the location depends on the type and severity of the intussusception. I would like to emphasize the importance of accurately palpating the abdomen. If, as often happens, the patient is frightened

1. Walls, F. X.: A Case of Intussusception, N. York M. J., 153: 617, 1918.

or in pain, a one or two grain nembutol suppository, avertin or even ether anesthesia should be given, and preparation to operate should be made so that a thorough examination may be done when the abdomen is relaxed. This is not done as often as it should be, so that more accurate information can be obtained. A mass can be felt in practically all cases except the ileo-ileal variety.

Rectal examination may be of considerable aid to palpation of a tumor mass if the patient is relaxed. I prefer abdominal examination alone, first, as this is less frightening to the child.

Chronic intussusception, which is often overlooked, probably occurs more frequently than we realize. It is more common in children past one year of age. The story of abdominal symptoms extending from a few week to months should make one mindful of it. The story is quite suggestive. Symptoms usually are as follows: The patient has pain and vomits, and at the onset is quite sick; there is usually intermittent colicky pain; no blood in the stool as a rule; or the stool is only slightly streaked with blood. As time goes on the symptoms get less and less, vomiting occurs only at longer intervals, constipation is persistent and the patient loses weight. Occasionally there is constipation alternating with small mucus stools. There is usually no fever. On careful examination one can usually palpate a tumor mass varying in consistency from moment to moment during palpation. This suggests the diagnosis. Then there often is an unnatural emptiness in the right iliac fossa (Dance's sign). This form is frequently mistaken for appendicitis, chronic enteritis, enlarged kidney and the like. In every case a careful history and examination should be made to determine the presence of a characteristic movable tumor. The gaping of the rectum was pointed out years ago by Broca and others as a very important finding in this group. Roentgen examination is very valuable in these cases to confirm our suspicions. X-ray findings are quite typical. The "U" shape filling when properly done is quite characteristic.

The *diagnosis of acute intussusception* in the typical case is quite easy if one will take the time to inquire carefully into the history. Characteristic, is a sudden onset usually in a healthy baby under one year with intermittent colicky pain, vomiting, presence of shock, a palpable mass and blood or bloody mucus on rectal examination, with a normal or subnormal temperature if seen early. It is important to make the diagnosis early, as the prognosis usually is in proportion to the length of time it has been present.

The flaccidity of the abdominal wall and the absence of abdominal distention in most cases of intussusception is characteristic. Rectal tenesmus with an empty rectum is an important finding when present.

One thing that has helped me when called to see a baby in whom I suspect an acute abdominal condition is first to elicit a careful history; second, as the baby is likely to be in pain and frightened, to have the mother hold the baby in her arms and gently, but firmly, press the baby's abdomen to her bosom. If a baby has an ordinary "colic" he likes to be held this way, but if there is some morbid intra-abdominal condition he will cry and push away from his mother as she presses him to her. The doctor, in this way, can observe the baby's action before he starts to examine the child. Then, if one will gently, with warm hands flat on the baby's abdomen, examine it before one pulls out his stethoscope, otoscope and various paraphernalia, that "spots" him immediately, one can usually obtain all the necessary information without further trouble. Leave the rectal examination to the last because this is disagreeable to a baby. The abdomen is usually soft and not distended early, so that the *mass* can easily be felt.

If there is any doubt as to feeling a mass, I have found a nembutol suppository (one or two grains inserted at home) to be helpful. By the time the baby gets to the hospital there is sufficient relaxation to feel the abdomen. But should one still not be satisfied and the history suggests an intussusception, then ether should be given and the patient should be prepared for an operation if necessary. Sometimes the anesthetic alone will be sufficient to relieve the obstruction. One must not be misled by the absence of blood in the stools; this is often a late finding or never present.

In the *differential diagnosis* of acute intussusception we consider first *acute appendicitis:* Acute appendicitis does not occur as often in infants. There is usually an elevation of temperature and increase in leukocyte count early, with no palpable mass or blood in the stool. Rigidity and tenderness are also more marked.

Vomiting usually is not as severe, nor is there shock, and the pain is not as intermittent.

Bleeding Meckel's diverticulum occurs in infants under two years of age in the majority of cases. The story is of a painless hemorrhage of considerable degree, greater than one usually has in an intussusception. There is usually absence of a tumor, vomiting and visible signs of hemorrhage.

In *prolapse of the rectum* there is usually no associated pain or shocks. The rectum usually prolapses after bowel movement, and upon examination there is an absence of reduplications.

In an intussusception sufficient to produce this extrusion through the rectum, symptoms must have been present for two or more days and the patient's condition by this time is usually critical. Rectal prolapse can be replaced, and extends directly into the mucosa; if not the transitional fold is felt a little distance above the rectal orifice.

Dysentery may give some difficulty in diagnosis, but if a careful history is obtained one usually finds fever and constitutional symptoms at the onset, frequent stools and the general symptoms more pronounced from the start. There is an elevated white count early, and prostration. There is no palpable tumor. In intussusception blood is not usually mixed with stools as it is in enterocolitis.

Henoch's purpura occurs usually in older children. There is abdominal pain, but more general symptoms: fever, petechia on the body and elevated white count. Usually there is no palpable tumor. There is often joint swelling and pain. Constitutional symptoms in Henoch's purpura usually overshadow the abdominal symptoms.

Tumors of the rectum such as adenoma are very rare and occur more often in older children. They can be felt digitally in the rectum, bleed easily, and are often associated with mucus and blood in the stools. There is no mass in the abdomen.

Thrombosis of the splenic vein may follow infection through the umbilicus; this is very rare. The general symptoms such as fever, etc., are more marked. There is usually a history of a discharge from the navel.

Foreign bodies in the rectum are usually found in children past five years of age. Digital examination and x-ray will suffice usually for a correct diagnosis.

Chronic intussusception is very often difficult to diagnose. This form is frequently mistaken for appendicitis, chronic enteritis, enlarged kidney or tumor and the like. In every case, a careful history and examination should be made to determine the presence of a characteristic movable tumor. The gaping of the rectum may be a very important finding. Roentgen examination is important and will confirm the diagnosis.

Incarceration of a chronic intussusception is diagnosed by the increase in pain, more violent attacks of colic, blood and mucus stools; also persistent vomiting and marked general symptoms.

One must keep in mind the fact that two conditions may exist together as in the case of a boy six years of age whom I saw recently, and who, 48 hours previously had a tonsillectomy. The child complained of pain in the abdomen and vomiting, and on examination a mass was felt in the abdomen. An intussusception was confirmed by a barium enema, a slide of which I shall show.

TREATMENT

Prophylaxis. There is no known way to prevent intussusception. The treatment is essentially surgical, and the earlier the operation is performed after the onset the better the prognosis. Occasionally when a case is seen early, and if one has the opportunity to have the services of an expert roentgenologist, or he himself is qualified, a barium enema properly given may not only aid in the diagnosis but also be used to relieve the obstruction. However, one must be sure the barium has entered readily into the small intestine. Even then a very small piece of the intestine may be adherent and fail to unfold; this may be overlooked roentgenologically, or an ileo ileal colic intussusception may reduce to the ileum and then be overlooked. When the roentgenogram shows that the intussusception has been reduced, one must also be sure that all of the symptoms have been relieved.

The preoperative and postoperative care are very important and certainly should be under the direction of a pediatrician or other qualified person.

The importance of giving fluids before or after the operation, or both, cannot be stressed too strongly. The results of an operation depend

often on how thoroughly and carefully this is carried out. I have found the continuous intravenous drip convenient and practical, and less painful to the patient. The ankkle vein (saphena magna) is used after immobilizing the leg on a wooden splint. The saphena magna, just in front of the internal malleolus at the ankle, is entered very easily by dissection; an 18 to 20 gauge needle or spinal puncture needle, which has been made blunt, makes a good canula. Enough fluid in the form of five per cent glucose in normal saline or Ringer's solution can easily be given by this method to combat dehydration and acidosis; and if necessary citrated blood can be given when indicated without further trouble. 500 to 1,000 c.c. of fluid can easily be given with practically no pain to the patient, and I am sure this has been instrumental in reducing our mortality in all surgical conditions in childhood.

Breast milk or other milk by mouth may be given to infants in very small quantities after six or eight hours, gradually increased, with water and weak tea in small quantities between milk feedings. Often in 24 to 48 hours after the operation the patient can be given sufficient fluid and food by mouth. These babies should be protected from individuals with acute infections, and also unnecessary chilling. Within five to seven days the average patient, who has been seen in time, is ready to leave the hospital.

SUMMARY

1. Intussusception is essentially a pediatric disease.

2. The earlier the diagnosis, the better the prognosis.

3. The symptoms in the acute variety are sudden onset in infants usually under one year, intermittent colicky pain, vomiting, a palpable mass and blood in the stool.

4. Two to one in males.

5. 75 per cent under one year.

6. 10 per cent of intussusceptions show no blood in stool.

7. Usually a mass can be felt. If necessary, give some anesthetic or analgesic.

8. Roentgen ray examination is very helpful, especially in the subacute and chronic types.

9. The importance of postoperative care; such as supplying fluids is most essential.

SOME PHARMACOLOGICAL CONSIDERATIONS OF INTESTINAL OBSTRUCTION

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There are several aspects to the problem of acute intestinal obstruction that present questions of interest to the pharmacologist. First in importance is the question of the toxemia that may or may not be present. Through the work of a number of investigators it has come to be fairly well recognized that in simple obstructions, namely obstructions without strangulation or marked distention, and particularly if they are in the upper intestine, toxemia can be largely excluded, or rather other factors can be shown to be sufficiently concerned in accounting for all the symptoms and laboratory findings that it is unnecessary to consider a toxemia as important. With the development of complications such as strangulation or even severe distension without strangulation, toxemia cannot be so easily excluded, and there is much in the way of circumstantial evidence from the laboratory and the clinic indicating that the absorption of some toxic principle or principles may be added to the harmful effects seen with simple obstructions. Of the many kinds of such circumstantial evidence I shall mention only one. McIver and White showed in 1929 that if a strangulated loop of intestine is exteriorized the onset of symptoms, as well as death, is delayed as compared with the course of events when a similar strangulated loop is left within the abdomen. There is a clinical parallel to this in the reports that an internal strangulation becomes more rapidly serious than a corresponding strangulation in an inguinal hernia. Other workers have shown in experimental animals that if a strangulated loop is enclosed within a rubber bag the onset of symptoms is again delayed just as when such a loop is exteriorized. There is thus circumstantial evidence that a transperitoneal absorption of toxic material from the bowel can occur even when it is not ruptured. There is also circumstantial evidence of the mesenteric absorption of toxic material under certain circumstances. Di-

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rect proof has thus far been lacking. This would consist of first detecting and identifying some toxic principle or principles in the circulation and secondly demonstrating that there is an adequate amount of such toxic substance to play a definite role in the symptomatology. We have had some success in our laboratory in demonstrating that a toxic substance, i. e., histamine, is concerned in the phenomena of acute anaphylactic shock in the dog, and since the toxic principles possibly concerned in intestinal obstruction have been suggested as being of this type, we have made a number of studies in cases of acute strangulation obstruction. We have failed thus far to detect any toxic substances in either the thoracic duct lymph or circulating blood in obstructed animals. We have learned, however, from our experiments in anaphylaxis that unless the intoxication is very sudden as well as overwhelming, the likelihood of directly detecting the toxic material in the blood stream is very limited because of the very rapid rate of its disappearance from the circulating blood. Consequently such negative tests do not exclude the possibility of a toxemia. They suggest, however, that a toxemia is not the single dominant factor.

Amongst the other factors suggested as operating in cases of obstruction are dehydration and loss of electrolytes from the blood, interference with the circulation, and some unexplained nervous factors. The question of dehydration and loss of electrolytes is being discussed by others on this program. I have not been impressed with the possibility of certain obscure nervous factors playing any role except as nervous mechanisms may contribute to the operation of the other factors mentioned. Mechanical interference with the circulation seems to me to be a quite important factor. If the intestinal tract of animals is distended from pylorus to anus with a relatively unabsorable gas such as nitrogen, the animals die in from 8 to 12 hours. If the portal vein of animals is ligated they die in from 6 to 10 hours. Even extremely severe distention, such as would prevent all flow of blood through the bowel wall, does not completely stop the flow of blood through the mesenteric vessels because there are anastomotic channels near the mesenteric attachment of the intestine which permit some flow. Nevertheless the similarity between the results of the two experimental procedures is quite striking. Most surgeons have occasionally witnessed an astonishingly prompt improvement in the general condition of certain patients following the relief of severe distention by an enterostomy. Although subsequently such patients do not necessarily go on to complete recovery, I know of no other adequate explanation for this prompt improvement in symptoms than such a restoration of the general circulation as undoubtedly follows this relief of the distention. As contributory evidence to this belief are the clinical reports that in patients with general peritonitis a fall in the systemic blood pressure often accompanies the development of marked meteorism.

The action of various drugs and of morphine in particular upon the intestine is of considerable interest. There is a paralytic ileus accompanying peritonitis and a paralytic ileus is frequently superimposed upon a mechanical ileus after the latter has persisted for a short time. There is a good reason to believe that the ileus is initially reflex in character as splanchnic or spinal anesthesia usually restores peristaltic activity. The paralyzed bowel responds apparently normally to stimulating drugs until gaseous distention and the resultant circulatory impairment damage the intestinal muscle. This has been experimentally demonstrated for a number of drugs and is probably true generally. The widespread use and general employment of morphine warrants special attention to its action. Alonzo Clark in 1879 was an advocate of deep morphinazation in the treatment of peritonitis and advised a semi-narcosis to insure, as he thought, a complete bowel rest. He gives credit to Graves in 1821 as the first to use clinically large doses of opiate in the treatment of peritonitis, and to Stokes in 1832 for the first publication on the subject. It came to be called the Alonzo Clark treatment, however, and modifications of his regime constituted the accepted therapy for many years as shown by the textbooks and publications of Austin Flint, Nothnagel, Kelly, Senn and many others. This type of therapy came in time to be challenged by a number of clinicians, not on the basis of observed therapeutic results, but rather on the notion that the drug-induced ileus was a two edged sword, splinting the bowel to restrict the spread of infection on the one hand, but intensifying the toxemia specifically related to the ileus on the other. Although numerous experimental studies of the action of morphine upon the intestine had been made, conflicting results

had been obtained so that in spite of the fact that Pal's studies in 1900 indicated that morphine had a stimulating action on the intestine, the well-recognized constipating action of morphine served largely to nullify such findings and to strengthen the belief that morphine was essentially depressant. It was not until 1926 that the work of Plant and Miller clearly showed that both in man and animals the characteristic effect is to increase motility. That the action of morphine is stimulant rather than depressant to the intestinal musculature is now generally recognized as Plant and Miller's observations have been confirmed by numerous workers, both for the normal intestine and when obstruction or peritonitis are present. An interesting and recent illustration of this smooth muscle stimulant action is presented in the observations of Walters and his coworkers on the ability of morphine to provoke an attack of biliary colic in certain patients after cholecystectomy.

Assuming a non-specific beneficial effect of the morphine regime it is interesting to note the changing conceptions of the mechanism whereby this is brought about. The initial interpretation, and it has by no means disappeared, was that morphine was beneficial by splinting the bowel, suppressing all peristaltic activity and thus preventing the spread of infection and favoring the localization of the process. With the recognition that morphine does not splint the bowel came the suggestion that it helped to overcome the effects of the ileus secondary to the peritonitis, by encouraging the transport of a toxic bowel content from the highly absorptive small intestine to the less absorptive colon. This is not the only way in which it could act and there is also some evidence that the motility induced by morphine is not effective in the transport of bowel content. The circulation through the bowel wall is greatly facilitated by the contractions and motility of the intestine. Conversely it is decreased in the paretic intestine and of course still further decreased by distention. I believe the indirect effect of morphine of improving the circulation through the bowel by promoting tone and motility in the intestine is the probable reason for whatever beneficial effect it may have in peritonitis.

I believe from what I have said that there is considerable justification for a pharmacologist being interested in what is chiefly a surgeon's problem.

(ILEUS) INTESTINAL OBSTRUCTION

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Ileus is a symptom-complex characterized by pain, vomiting, tympanities and obstipation. Some of these symptoms may be absent due to the site and type of the obstruction.

The process is a progressively developing, pathological entity which may be slow or rapid depending on the location and completeness of the obstruction.[1] Ileus is the end result or complication of all neglected cases of intestinal obstruction of a mechanical nature.

Of the many classifications of ileus, the one offered several years ago by Dr. Dean Lewis[2] is simple and satisfactory. I will therefore take the liberty of quoting it here.

Ileus may be divided into:

1. *Mechanical Ileus* in which there is a definite mechanical obstruction to the lumen of the bowel, such as occurs in carcinoma, bands, volvulus, intussusception, foreign bodies in the lumen, etc.

2. *Strangulation Ileus* in which the vessels are involved as in embolism or thrombosis. Any mechanical type becomes this type when the blood supply is interfered with. Paralytic types of ileus may likewise present similar pictures when the vessels become involved.

3. *Adynamic Ileus* in which the musculature of the bowel wall is paralyzed, as in peritonitis, torsion of the pedicle of ovarian cysts and fibroids, epididymitis, gallstone and renal colic, and reflexly with pneumonia and pleurisy.

4. *Dynamic Ileus* in which the musculature of the bowel wall is contracted, as in lead and some other poisonings, and in diseases of the central nervous system such as locomotor ataxia.

On account of time this paper will be limited to the discussion of the mechanical and adynamic types of ileus.

Intestinal obstruction, in spite of our better present day methods of diagnosis and treatment, continues to be one of the most deadly of all intestinal conditions and causes about the same

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mortality that it did two if not three decades ago. The majority of untreated cases of mechanical obstruction, sooner or later develop interference with the blood supply, and unless promptly relieved, will go on to a fatal termination. It is therefore vitally necessary to recognize this condition early and to differentiate between the simple mechanical and strangulation types, because when strangulation supervenes, an associated toxicity develops which increases rapidly and causes an early death.[3, 4, 5]

In ileus as Oschner[6] states, the normal function of the bowel, consisting of peristalsis, secretion and absorption, become so altered that the life of the individual soon becomes endangered.

Following mechanical interference definite pathological changes take place in a definite ratio to the completeness of the obstruction. All writers agree that the contents of the bowel above the obstruction is toxic and that the higher the obstruction the greater will be the absorption of this toxic substance.

In high obstructions the symptoms are therefore more acute.[7] Dehydration is also greater. It is correspondingly true that the more distal the obstruction occurs the less severe will be the symptoms and the longer the length of survival, other things being equal. In high obstructions there is an associated loss of the secretory intestinal juices which is very important.

Obstructions relieved before interference with the blood supply of the bowel takes place show a five per cent mortality. After strangulation has occurred the mortality rapidly mounts and varies in different reports from 30 to 70%.[8, 9, 10] Unless strangulation is relieved within 48 hours after its onset the death rate will reach practically 100%.

The length of the strangulated loop is also an important factor. Brooks[7] states that the shorter the strangulated loop the more rapid are the onset of the symptoms and the more fatal the outcome. This is conceded by other writers.[11] When the strangulated loop of intestine is of sufficient length it is possible that death may occur from the sudden withdrawal of blood from the circulation.[11] Perthes, however, feels that death does not result from shock, but from an associated autointoxication of some kind.

In intestinal obstruction certain chemical, anatomic and bacterial changes take place when the blood supply to the bowel becomes involved. These changes are most rapid when the blood supply becomes completely shut off. Stout[1] feels that at the time obstruction occurs a specific toxin is formed with an associated disturbance of the water, gas and sodium chloride exchange through the intestinal mucosa, which is due to the circulatory deficiency of that tissue. Matthaes[12] attributes the excessive thirst of these patients to this sodium chloride impoverishment.

Theories of Toxin Formation

The exact nature of this toxin still remains undertermined. Lewis[2] feels it is similar to that found in moist gangrene. The late Jeff. Miller[13] compared it to the toxin of gas gangrene. Shier[14] feels it results from some protean decomposition plus bacterial action. Others are of the opinion that it follows some associated action of the pancreatic juices.[15] As far as the toxemia is concerned there is a close similarity between high obstructions and acute hemorrhagic pancreatitis. Brooks[7] states that Shonebauer, by experimental introduction of trypsin and bacteria into the peritoneal cavities of animals, was able to produce death in these animals, similar to that of acute obstruction.

Oschner,[6] Stone[16] and Angle[9] note the similarity of this toxin to adrenalin. Draper[17] feels it is a normal product of the duodenum which, under normal conditions, is detoxified at lower levels; that following obstruction this change does not take place and death results from the absorption of the unchanged toxin. Ellis[18] has demonstrated the toxin in the bowel lumen of fasting animals after three or four hours. Scudder, Zweiner and Whipple[19] have noted that adrenal insufficiency and intestinal obstruction have many features in common. In both there is a disturbance in potassium metabolism, and in their experimental work they report a rise in the blood potassium following obstruction to lethal levels.

Davis and Stone[20] have found that the normal contents of the intestine develops no toxicity as long as bacterial action is eliminated, and that bacterial action will become marked as soon as the blood supply is interfered with.

While the exact nature of this toxin still remains elusive and undetermined all writers are agreed that it does exist and that it becomes most marked following impairment of the bowel circulation.[11, 16, 21, 22]

It may therefore be concluded that strangula-

tion is predominantly a matter of toxemia;[6, 23, 24, 25] that the higher the obstruction the more acute it becomes, the more rapid is its course, and the more fatal its termination.[7, 26]

When strangulation occurs, definite changes take place in the bowel wall due to interference with the blood supply. Similar changes will take place from pressure following bowel distention.[16] Distention is less marked in small than in large bowel obstructions, due to the difference in arrangement of the mucosal folds and circular fibres of the colon and small bowel walls.

The bowel proximal to the obstruction becomes first pink in color, later a dusky red and finally black or grey and gangrenous. The peritoneum covering the bowel becomes grey and loses its lustre. Fluid accumulates rapidly, stagnates and therefore becomes lost to the body. This results in a marked dehydration.

It is estimated that the fluid normally secreted into the upper intestinal tract, via the mucosa of the bowel, liver and pancreas will, in twenty-four hours, equal the total volume of the blood and lymph of the body. Under normal conditions this is absorbed at lower levels.

Gatch and Culbertson[27a] have found that distention sufficient to arrest the circulation of the bowel wall will upset the selective absorption of the mucosa in from five to fifteen hours. As the mucosa becomes devitalized the contents of the strangulated loop becomes very toxic and anaerobes, chiefly the B. Welchii, become dominant.[16]

The toxin probably enters the general circulatory system via the lymphatics of the mesentery and through the thoracic duct. Donaldson[24] has found that the lymphatics of the mesentery remain open for days after venous thrombosis has occurred. When the toxin reaches the general circulatory system certain constitutional symptoms follow. There is an impairment of the central nervous system; a toxic nephritis occurs from kidney damage; the pancreas becomes acutely congested[7] and an adrenal insufficiency develops.[6]

Locally with the disappearance of the "vital function" of the bowel wall pathological organisms may reach the peritoneal cavity. In this event a general inflammatory reaction will occur. Whether peritonitis or perforation will supervene will depend upon the location of the obstruction, the time factor and the virulence of the toxemia.

Stout[1] sums up the pathology of strangulation as a specific toxin with a disturbance of the water, gas and sodium chloride exchange through the gastro-intestinal mucosa caused by a circulatory deficiency of that tissue. It is a disorganization and impairment of the motor function of the gastro-intestinal tract with subsequent changes and a peculiar type of toxemia.

Mortality of Ileus. The mortality rate in ileus as given by different reports still varies between 40% and 70%. It is very high under one year of age and over 50. It correspondingly increases after 50 in a direct ratio to the age of the patient. Obstructions of the duodenum at a place just below the openings of the pancreatic and common bile ducts cause the most acute symptoms and the earliest death. The length of survival becomes greater the more distal the condition occurs from this location.[7]

If subsequent intestinal paralysis persists, due to prolonged stretching of the bowel wall, the patient will die even though the obstruction is relieved.[8]

If sufficient time has elapsed before surgical relief for marked damage to the bowel wall to take place, and for systemic effects to manifest themselves, no treatment will prevent a fatal termination. When strangulation supervenes death will occur in a direct ratio to the amount of bowel damage because this damage will regulate the amount of the associated toxemia. In cases of arterial thrombosis death often occurs in from eight to 18 hours. Unrelieved obstruction will cause death in practically all cases.

The greatest cause of this high death rate is delay in treatment. It is estimated that 90% of these patients could be saved if they were operated on within the first six hours.

Symptoms of Ileus

The symptoms of ileus depends on the site and type of the obstruction. When obstruction is incomplete the symptoms progress slowly and intermittently. When complete obstruction occurs the symptoms are constant and profound. As McCormick[27] states, "to combat this problem more successfully, one should become ileus conscious and should not wait until the old classic textbook picture of regurgitant vomiting, general abdominal distention and prostration are present." These symptoms, as Wangensteen[28, 29] has so aptly stressed,

usually spell the beginning of the end and should therefore be labeled ante mortem instead of diagnostic signs. Regurgitant vomiting and distention are too often hopelessly terminal symptoms.

In cases of early intestinal obstruction the temperature, respiratory rate and pulse are normal. The leucocyte count is also normal unless vomiting has been marked.

Blood chemistry changes, such as depletion of the chlorides, elevation of the blood urea and alkalosis, are all late symptoms and, as a rule, do not manifest themselves until after 48 hours. In some colon obstructions they do not appear at all.

Intermittent, crampy abdominal pain with nausea and considerable vomiting, without abdominal rigidity or tenderness should be strongly suspicious of intestinal obstruction. If pain and vomiting continue after the bowel has been emptied by enemata, the suspicion is more conclusive. If loud intestinal noises are heard on auscultation and a flat x-ray picture shows gas accumulations in the small bowel, the diagnosis of mechanical obstruction should be complete.

In the more acute obstructions pain is sudden in onset and is as a rule severe.[30] It is usually localized above and to the left of the umbilicus in small bowel obstructions and below and to the left in large bowel obstruction.[31] However, it may occur elsewhere. Later when the pain becomes more or less generalized and continuous, it usually signifies that the bowel lumen has been completely blocked.

Vomiting generally follows pain but in some of the Cook County cases it preceded it. The vomitus at first consists of gastric contents, later of intestinal material and finally it becomes feculent in type.

Tenderness is absent in early obstruction and when present generally means that peritonitis has already developed.

Rigidity is always a late symptom.

Distention is a rather late symptom and is always much greater in large than in small bowel obstructions.

Pulse, Temperature and Respirations. These are not involved early. Rapid shallow respirations, a quick small pulse and an elevated or subnormal temperature are always ominous, and are usually definite proof of a severe existing toxemia resulting from marked bowel damage.

X-Ray Examination. Plates should be taken in the prone and upright positions. If the erect position is impossible on account of the patient's condition, lateral exposures should be made. An enema should always precede this examination to clear the bowel below the obstruction of gases and fecal material. Much improvement in diagnosis from an x-ray standpoint may result from the work of Abbott and Johnson[32] with their use of dilute barium solutions given through the Wangensteen tube.

Adynamic Ileus

Ochsner and Gage[6, 33] state that most cases of ileus developing 24 to 48 hours postoperatively are adynamic in type. This type results from peritoneal or splanchnic irritation which may be chemical, thermal or bacterial in nature.

Adynamic ileus is almost always associated with peritonitis.

Here, as in the mechanical types, intestinal secretions increase, the bowel becomes distended, absorption is lessened and toxemia develops. However, in this type of ileus the pain is dull in character and is continuous. It is not the colicky type of pain found in the early mechanical types.

Auscultation is most important because in the adynamic type, as in peritonitis, there is the silent abdomen with complete absence of all peristaltic sounds, instead of the turbulent, gurgling bowel noises such as one hears in the mechanical types.

In adynamic ileus the paralytic obstruction generally involves the entire intestinal canal.

Fey and Cubbins[34] feel that at times only a segment of the bowel may be so affected. It is possible that in some instances of slight involvement this may be true.

In the differential diagnosis it is necessary to remember that distention, dilation of the stomach, dehydration due to loss of absorption, and alkalosis, may develop in both types. The passage of flatulence and feces may follow enemas in both types. Chills may be present in the adynamic but not in the mechanical type.

When peritonitis develops there is temperature, constant pain and leucocytosis.[6,31]

It is most important that we differentiate between these two types because in the mechanical form early surgery offers the only help, while in adynamic ileus, with or without peritonitis, stomach and duodenal drainage as advocated by Wangensteen will generally suffice.

Large Bowel Obstructions

Large and small bowel obstructions are separate conditions, both clinically and pathologically.[14, 35]

When obstruction occurs in the colon the picture is entirely different, this being due to several causes. The large bowel, on account of its peculiar construction, has the power to dilate to a remarkable degree. Regardless of where the colonic obstruction occurs the ileocecal valve, as DeCourcy[36] states, acts as a powerful check and will prevent regurgitation into the small bowel.

Dehydration is absent or is much less marked because the fluids in the small bowel can still be absorbed at lower levels. Toxicity is also less for this same reason. Vomiting is absent or is a very late symptom. Strangulation very seldom occurs in large bowel obstructions except in cases of volvulus of the cecum or sigmoid; where a portion of the bowel becomes strangulated in a hernial sac or where rarely a carcinoma may invade the mesentery and from pressure obstruct the vessels.

The colon, however, does suffer from interference with the blood supply to its walls caused by the distention. It is remarkable, when one considers the force applied to the ileocecal region from pressure, that rupture does not occur more often.

CONCLUSIONS

1. Ileus still continues to be one of the most deadly of all abdominal conditions.

2. It is a very frequent, if not the most common cause of postoperative abdominal complications.

3. This deplorable situation can only be improved by becoming ileus conscious, which will result in earlier diagnosis, earlier recognition of types and the earlier institution of treatment.

4. Until this takes place, and the patient, by means of popular medical education is also made to realize the danger of delay, no better end results may be expected

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SOME PHYSIOLOGICAL PRINCIPLES INVOLVED IN ACUTE INTESTINAL OBSTRUCTION

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Knowledge concerning the pathogenesis of intestinal obstruction has been greatly amplified by a number of recent experimental and clinical studies. These have served not only to increase our understanding of the normal physiology of the gastro-intestinal tract and of the sequence of events that follows upon interference with the onward passage of the intestinal current but have contributed very strikingly and successfully to the practical treatment of patients. However, while this is true, the divergence of opinion among careful students ot the disease is still so great that, while some ascribe all of the ill effects to an intoxication from the obstructed intestine, others deny that a toxemia exists and believe that the loss of water and salts from the body can account for the entire symptom-complex and lethal issue. It is probable that this difference of opinion has in many cases led to delay in the institution of proper treatment, has brought into undue prominence some of the associated but less important factors in pathogenesis, and in these ways prevented that decrease in mortality which our increasing knowledge of the disease should have made possible. It is a regret to me that time and the nature of this paper do not permit an analysis of the really vast literature that has accumulated on this important topic. I have chosen to restrict my discussion to two major pathogenic factors in this disease that seem to have been established and to illustrate these points by the description of certain of my own experiments, which in many cases simply confirm work done previously by others with different methods.

It has long been known that the upper part of the gastro-intestinal tract is chiefly secretory in function whereas the lower part is mainly absorptive. Stated somewhat differently so far as the passage of water and inorganic salts between the blood plasma and the lumen of the intestine is concerned, the drift is predominantly

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toward the digestive tract in the stomach, duodenum, and jejunum and toward the blood plasma in the ileum and colon. A given quantity of physiological salt solution placed in an isolated segment of the duodenum or jejunum can be recovered quantitatively several hours later, while if placed in the ileum or colon it will be largely absorbed. It is a matter of common observation that the water and inorganic salts which make up the bulk of the digestive secretions entering the alimentary tract are completely reabsorbed since under normal conditions but little water is lost in the feces. It is obvious that for this reabsorption to take place the various secretions must be carried by the motor activities of the intestine into the ileum and colon, and it is equally clear that when complete obstruction occurs in the upper intestine the water and salts will not reach the absorbing mucosa and are consequently lost to the body either through vomiting or accumulation in the non-absorbing regions of the digestive tract. Does this failure of reabsorption of any one or all of the digestive secretions account for the systemic disorder present in obstruction? Is there a toxemia present due to the absorption of poisonous materials from the obstructed intestine? These are, broadly speaking, the two important questions in the pathogenesis of acute intestinal obstruction. The experimental evidence and analysis to be presented here proves to our mind that the continued uncomplicated loss of certain of the digestive secretions from the body does cause adverse symptoms and death with changes in the blood chemistry similar to those occurring in clinical cases of acute intestinal obstruction. It is further demonstrated that under certain conditions in which an increase in tension within segments of intestine is permitted to develop, a toxemia occurs due to the absorption of poisons from the distended segment. This toxemia is also accompanied by characteristic changes in the blood chemistry. Furthermore, there is considerable evidence which indicates that the toxic materials absorbed from the intestine under these conditions increase the outpouring of fluids from the digestive gland into the upper intestinal tract, where but little reabsorption takes place.

The Total Loss of Gastric Juice from the Body. Complete obstruction at the pylorus in the dog, cat, rabbit, or monkey causes death within three to four days. There occurs an increase in the carbon dioxide combining power of the blood plasma, a fall in the blood chlorides, and a rise in the non-protein and urea nitrogen (MacCallum, Lintz, Vermilye, Leggett and Boas 1920,[1] Hastings, Murray, and Murray 1921,[2] Haden and Orr 1923,[3] and Gamble and Ross 1925[4]). These animals, with the exception of the rabbit, vomit repeatedly and their death has been attributed to the extensive loss of the various constituents of the gastric juice. The rabbit, which does not vomit, dies within a short time, and there is found in the dilated stomach a large amount of water, fixed base, and chloride ion (Gamble and McIver 1925[5]). The continued excretion from the body by the gastric glands of large amounts of water, hydrochloric acid and, as Gamble has pointed out, of sodium ion can account satisfactorily for the fall in blood chlorides, the increase in carbon dioxide combining power of the blood plasma, and the dehydration. Such a theory necessarily assumes that the gastric glands can separate the elements for their secretion (chiefly hydrochloric acid) from the blood plasma when the chloride concentration of the latter is less than normal and an alkalosis exists. It furthermore assumes that these glands can continue this separation until the blood becomes so abnormal that life cannot exist. The mechanism for maintaining a constant composition of the blood, upon which life depends, would then be subordinate to the mechanism for providing gastric juice. That this unique assumption is essentially correct is strikingly illustrated by an experiment reported a number of years ago (L. R. Dragstedt and Ellis 1930[6]). The entire stomach of dogs, with its secretory innervation and blood supply remaining intact, was isolated from continuity with the alimentary tract as illustrated in Fig. 1. After such an operation it is clear that all of the gastric secretion will be permanently drained away. Food passes directly from the esophagus into the upper end of the duodenum. The stomach, isolated in this manner, secretes an extraordinarily large amount of gastric juice (600 to 2600 cc. per 24 hours) of high acidity (0.35 to 0.45 per cent. HCl) and pepsin strength. Its secretory function is probably not greatly below the normal. The nervous or reflex phase of gastric secretion, depending upon the sight, smell, and taste of food, is not interfered with, nor is the chemical

phase, at least that part of it brought forth by the presence of food in the intestine.

Accompanying this secretion there occurs a profound change in the blood chemistry, an exaggeration of the alkaline tide observed after eating. These changes are illustrated by the data in Table I taken from one of the experiments. There is a profound fall in the concentration of blood chloride, an increase in the carbon dioxide combining power of the plasma, a shift in the pH toward the alkaline side, and a late increase in non-protein and urea nitrogen. The animal recovers promptly from the immediate effects of the operation and for two or three days may appear in good condition. Finely ground lean meat and water are supplied ad libitum and are taken in small amounts at frequent intervals during the day and night. The stools are formed and undigested meat particles are not commonly seen. From the time of the operation, however, the dog loses weight steadily. After two or three days an anorexia appears, he refuses food and water and becomes progressively more weak and depressed. The tissues seem to melt away, the weight loss in 24 hours ranging from one-tenth to one-twentieth of the total body weight. And yet during this period large volumes of highly acid gastric juice are constantly secreted by the isolated stomach. Death occurs to the weakened, greatly emaciated animal in five to eight days. The picture is that of profound depression. The changes in the blood chemistry are roughly proportionate to the severity of the symptoms, and both are without question due to the removal or loss of gastric juice.

The Total Loss of Pancreatic Juice from the Body. Many experiments involving the partial or complete loss of pancreatic juice from the body have been done since De Graaf first made an external fistula of the major pancreatic duct of the dog. The types of fistula commonly employed produced only a partial loss of the pancreatic juice, and the gradual loss of weight that ensued was uniformly attributed to the disturbance in digestion caused by the absence of an important digestive secretion from the alimentary tract. That the total loss of pancreatic juice produces a fatal effect was first clearly demonstrated by Elman and McCaughan (1927)[7] and is especially well illustrated by a new type of pancreatic fistula devised in our laboratory several years ago (Figure 2).[8] The method consists essentially in preparing an isolated sac of that portion of the duodenum which receives the pancreatic ducts and in leading the juices to the exterior by means of a gold plated cannula similar to that used in the isolated stomach. The volume of pancreatic juice collected from such a preparation varies from 500 to 1700 cc. per 24 hours. It is estimated that 10 to 50 cc. of this represents the secretions from the mucosa of the duodenal sac since this amount may be secured from a similar isolated segment which does not receive the pancreatic ducts. This large volume of secretion probably represents the normal output of the pancreas and it is evident that most estimates of the normal volume of pancreatic as well as gastric juice are far too low. Accompanying this secretion, there occurs a characteristic change in the chemistry of the blood, in some respects opposite to that following the loss of gastric juice. There is a decided decrease in the concentration of fixed base (155 to 130 m.m.), to a lesser extent a decrease in chloride (101 to 84 m.m.), a marked decrease in HCO_3 from 23.0 to 8.5 m.m., and a shift in the pH toward the acid side (7.35 to 6.95). The animals lose weight steadily and progressively and become rapidly weak and depressed. Death occurs within three to six days or the animals become so moribund in that time that it is read-

TABLE I

TABLE SHOWING THE EFFECT OF TOTAL LOSS OF GASTRIC JUICE ON BLOOD CHEMISTRY

			Gastric Juice							Blood Chemistry	
	NPN	Urea N	Vol.	% Free	% Total		Total			Cl	CO_2
pH	mg.	mg.	cc.	HCl	HCl	% Cl	Cl	Days	Remarks	mg.	cc.
7.30	27	13	...	....	....	....	...	1	Normal Control	298	41
7.57	39	20	815	0.478	0.515	0.57	4.56	47	Condition Good	266	70
7.63	52	29	415	0.471	0.500	0.52	2.15	48	Condition Good	208	97
7.70	80	49	260	0.400	0.455	0.495	1.28	49	Depression+	183	108
7.95	90	55	122	0.330	0.496	0.467	0.57	50	Depression++	177	114
7.73	109	78	250	0.354	0.420	0.531	1.33	51	Depression+++	110	120
...	40	22	832	0.354	0.400	0.497	4.10	58	2000 Ringers daily for 7 days	227	65

ily apparent they will shortly die. The striking changes are severe tissue dehydration and acidosis, and the clinical picture that of depression.

The Total Loss of Bile and Succus Entericus from the Body. It seems clear that both man and the lower animals can withstand the total loss of bile, draining away by a biliary fistula, for relatively long periods. The symptoms that ensue are referable to the disturbance in digestion due to the absence of bile in the intestine and to a much less extent to the loss of substances excreted in the bile. Even here it is likely that of the substances lost, the bile salts are of greater significance than the inorganic elements since to a certain extent the further elaboration of bile is dependent upon the reabsorption of bile salts in the intestine. A complete biliary fistula after removal of the gall bladder should result in a greater loss of chloride than when the gall bladder is present, owing to the capacity of the mucosa of the latter to reabsorb this element. In either case the total disturbance is of a chronic nature and does not present the catastrophic features seen when complete loss of pancreatic juice or gastric juice occurs.

It has long been known that the continued loss of the secretions of the mucosa of the jejunum, ileum or colon, may be compatible with normal health for long periods. Fistulae of the type described by Thiry and Vella, using longer or shorter areas of these parts of the intestine and in which the succus entericus has been drained away, have been made by many investigators and no particular ill effects observed. The work of Herrin and Meek[9] however indicates that when the intestine is distended, as commonly occurs in obstruction, the secretion of succus entericus may become so augmented that appreciable losses of electrolyte occur even to the extent of causing death.

The experimental evidence available at present, of which this detailed above forms only a part, proves quite conclusively that the stomach and pancreas and under certain conditions the intestinal mucosa, can separate chloride and sodium from the blood plasma until the concentration of these elements in the blood becomes so reduced and the chemical structure of the blood so altered that death results. Such an effect is produced not only in acute intestinal obctruction but also in other conditions in which these digestive secretions fail to reach the absorbing mucosa of the lower intestine. The progressive loss of sodium and chloride ion reduces the capacity of the body to hold water and a dehydration often very severe is produced. The greater importance of the sodium ion in this effect has been demonstrated by the work of Gamble. After four or five days total loss of gastric or pancreatic juice, the dehydration of the tissues is extreme, as evidenced by the large loss of body weight (one-fifth to one-third of the total), the loss of tissue turgor, the shrunken eyeballs, and general emaciation. It is remarkable that such an animal does not attempt to replace the lost fluid by drinking, since he has at all times free access to unlimited amounts of water. Apparently thirst is related not so much to actual dehydration as to a disproportion between the total amount of water and dissolved electrolytes in the body. Furthermore, water alone given by stomach tube or as 5% glucose solution given intravenously, will not relieve the dehydration. It is immediately excreted in the urine.

If, when it is apparent that the animal is soon to die from the continued loss of gastric or pancreatic juice, it is given 0.9% NaCl or Ringer's solution intravenously in adequate amounts, it promptly recovers, begins to eat and drink in normal fashion, and the blood chemistry returns toward normal values. By the daily intravenous injection of from 2,000 to 3,000 cc. of Ringer's solution we have been able to keep such animals alive for eight months. Apparently, then, the essential substances removed in these juices are contained in NaCl solution. The inefficacy of water alone indicates the importance of the Na and Cl ions. The intravenous salt solution not only corrects the abnormal changes in the blood chemistry but it likewise relieves the tissue dehydration.

Loss of weight is prevented by such injections or, if it has already occurred, may be replaced. This clearly indicates that the ability of the body to hold water depends in large part upon its content of electrolytes.

Thus far attention has been directed only to the loss of electrolytes and accompanying water from the vascular spaces in obstruction. When, however, extensive vascular damage to the obstructed intestine occurs as in some cases of strangulation, volvulus, or where large vessels

become thrombosed, a loss of plasma protein into the lumen of the intestine or peritoneal cavity takes place. The clinical symptoms are those of severe pain, early prostration, and vascular collapse—the picture is that of surgical shock, as emphasized by Foster and Hausler.[10] The situation very closely resembles that produced experimentally by traumatizing the legs or intestines of animals. Here the various features of the shock syndrome have been demonstrated by Phemister, Blalock, Harkins, Roome, and others to be due to the large loss of blood plasma rather than the absorption of a toxin produced in the damaged tissues. The extensive loss of plasma protein through the walls of the damaged capillaries is chiefly responsible for the marked increase in concentration of the blood and this in turn to the greatly diminished circulating blood volume.

Is There a Toxemia in Acute Intestinal Obstruction? The possibility of intoxication from the intestinal tract aside from that produced by specific pathogenic bacteria or ingested poisons has been considered by the clinician and experimental investigator for a great many years. Every student of disease must have reflected that of the epithelial membranes which separate the body from the environment, namely, that of the skin, respiratory tract, genito-urinary tract, and alimentary tract, the latter is subjected to the greatest variety of noxious agents at all times throughout life. An infinite variety of chemical substances is taken in the food, and these together with their degradation products produced by the digestive enzymes and the metabolism of the intestinal bacteria present to the absorbing mucosa chemical fractions of all degrees of toxicity. The view has changed from that which held that a great variety of diseases were directly or indirectly due to the absorption of intestinal poisons to the present current conception that these poisons play little or no role in pathology. The former view perhaps received its great impetus through the work and teachings of Bouchard, Metchnikoff, Roger, and Lane while the modern attitude has resulted partly from the failure of therapeutic measures directed against such intestinal toxemia and partly as a result of physiologic investigation which has revealed a protective mechanism against intoxication of intestinal origin. Is this protective mechanism at all times adequate?

Attempts to demonstrate poisons in the blood of obstructed animals have been entirely unsuccessful (McLean and Andries 1912[11] and Wilkie 1922),[12] and the evidence that a toxemia of intestinal origin exists is largely indirect. Thus the transfusion of blood from a dog profoundly sick as a result of acute intestinal obstruction into a normal dog has not produced symptoms of intoxication in the second animal. In this connection, however, it is important to bear in mind the great difficulty of demonstrating the existence even of known intoxications by examining the circulating fluids of the body. Some experiments carried out with Dr. M. L. Montgomery[13] to test this point indicate that only a small proportion of an injected poison remains in the circulating blood, the greater part being promptly removed by the tissues. Two animals were arranged so that the carotid artery of one and the jugular vein of the other were connected through a system of tubes. By merely turning a stopcock it was possible at any time to shift blood from animal A to animal B and simultaneously the blood from B to A. Various poisons were then given to animal A and at intervals thereafter, a cross circulation established. Although, for instance, a double lethal dose of strychnine was injected intravenously in A, so rapidly was this removed from the circulation that when two minutes later the blood from A was shifted into the vessels of B, no evidence of strychnine poisoning in the latter could be observed. Furthermore, although this cross circulation was continued for over an hour at which time animal A died in typical convulsions, no symptoms of intoxication appeared in B. The failure therefore, to demonstrate toxic properties in samples of blood is accordingly by no means conclusive evidence that such an animal has not been poisoned.

The dog has been a most useful animal in which to demonstrate the importance of failure of reabsorption of the digestive juices and loss of plasma protein as pathogenic factors in acute intestinal obstruction. Indeed the fact that it is possible to keep dogs alive for five or six weeks with complete obstruction in any region of the small intestine by the simple expedient of supplying two liters of physiological salt solution by intravenous injection each day, suggests that Gamble's conclusion that we need look no farther for the lethal factors in obstruction is

correct. Indeed I believe that in the dog this is true for the type of simple obstruction exemplified by section of the intestine and closure of the divided ends or by ligation of the intestine with tapes. Unfortunately, however, it is not the case in man. Many have learned to their sorrow that in the most common site of small intestine obstruction in man, namely the ileum, the parenteral administration of salt solution has not produced the effect seen in the dog, has not greatly prolonged life, nor markedly reduced the mortality of the disease. How can we account for this difference between the experimentally produced obstruction in the dog and its counterpart in man? I am confident that all those who have studied the disease under experimental conditions in the dog and who have at the same time had an opportunity to observe it at the operating table will agree that there is at least one definite difference between the two conditions. Let us take a more or less common example, that of acute obstruction of the lower ileum in man due to the pressure of a band of adhesions resulting from previous disease of the appendix or its surgical treatment. The intestine above the site of obstruction is commonly greatly distended with gas and intestinal content; the diameter is four or five times the normal and the increased length of the distended obstructed bowel produces segmentation so that the lumen is occluded by sharp kinks at intervals of ten to twelve inches. That segment immediately above the obstruction is almost always most distended and if the obstruction is of several days duration there may be evident discoloration of the wall and necrosis of the mucosa. In the dog, on the other hand, with an obstruction similar in nature the proximal intestine is contracted, the walls have suffered no vascular damage, and segmentation does not occur. The difference is most readily accounted for by the relatively large amount of muscular tissue in the dog's intestine which enables it to resist a much greater distending pressure without dilatation. With this difference between the two species in mind we attempted several years ago to reproduce in the dog an isolated segment of intestine in which an increase in pressure could develop and lead to distention and vascular damage so that the factors involved could be investigated. The jejunum or ileum was divided in two places about ten inches apart and the ends of this isolated segment infolded and closed, taking care not to injure the mesenteric blood supply. The continuity of the alimentary tract was re-established by suture of the proximal and distal intestine. The closed isolated segment thus produced was dropped back and the abdomen closed. Usually within two or five days the segment became distended with a highly toxic foul smelling fluid, damage to the wall sometimes even to perforation occurred, symptoms of depression and then prostration developed and the animal died. - Variations of this experiment were then done which lead us to conclude that the cause of death was absorption of toxic materials formed in these closed loops by the action of the intestinal bacteria, and that the factor which made possible this absorption was damage to the mucosa produced by the distention. The numerous and ingenious experiments of Professor W. D. Gatch of Indianapolis and his conclusions are entirely in harmony with this view. I wish now to present some evidence obtained recently in our laboratory[14] that seems to provide final proof that a toxic product of bacterial origin, normally not absorbed by the mucosa, may be absorbed and produce a fatal toxemia when the intra-intestinal pressure is raised. Closed segments of the small intestine of dogs as previously described were prepared and there was placed in them a small amount of barium sulphate so that distention could be followed with the fluoroscope and in addition a large amount of a very potent toxin produced by Clostridium botulinum. Botulinum toxin was found to be non-toxic on oral administration to dogs and the serum of such animals was found to contain no botulinum toxin when tested on mice. As the closed segments containing the toxin became distended, the animals showed symptoms of depression, and the blood serum was found to contain botulinum toxin in significant amounts. The toxin was in some cases found to be absorbed from the closed intestinal segment before the distention had produced any apparent vascular damage to the wall but it was much more marked when this occurred.

It seems to me that this experiment furnishes conclusive proof that a poisonous substance of bacterial origin which is not absorbed by the normal intestinal musoca, is absorbed when that mucosa is damaged by distention. The clinical application of this finding is evident since the dis-

tended segment immediately above an acute obstruction in the ileum contains a highly toxic product which is produced by the proteolytic activity of bacteria and is not absorbed by the normal mucosa. Distention of the obstructed intestine in man occurs because of the relatively thin wall but is absent in simple obstruction in the dog. For this reason a toxemia complicates the picture of obstruction in man but not in the dog. It is quite probable that if man possessed the thick muscular intestine of the dog the mortality of simple acute obstruction would have been reduced to an insignificant figure by simple replacement therapy with water and salt solution. This reduction in mortality has not occurred and attention must be again focused on local factors in the obstructed bowel.

Wagensteen has clearly demonstrated the efficacy of vacuum suction, by means of a nasal tube introduced into the stomach or duodenum, in decompressing the upper intestines. We are indebted to him for a method that has a great value in the treatment of paralytic ileus and which so markedly increases the comfort and safety of patients after abdominal operations. I believe, however, that the adoption of this treatment in acute mechanical obstruction is unwise, because the segmentation, previously discussed, makes it impossible to be sure that the decompression has extended sufficiently low in the intestine and has relieved that crucial segment immediately above the obstruction site.

It has thus become increasingly clear to me that we must still insist on the old dictum of immediate operation for this disease. Realization of the importance of supplying water and salt where extensive vomiting has occurred, and the necessity of blood transfusion to replace the lost plasma in strangulation, are of the very greatest importance but should not result in delay in attacking the proximal cause of the trouble by surgical measures. It is not my purpose to discuss these in any detail and they vary of course with each individual case. Where extensive vascular damage has occurred, exteriorization and then resection of the implicated segment has proved most useful. The escape of obstructed content into the intestine below need occasion no concern since the toxic material is not absorbed through a normal mucosca. Where vascular damage is absent or where the circulation returns promptly after the obstruction is released, resection is of course not indicated. The obstructed intestine, however, frequently remains distended and quiet and a paralytic ileus supervenes. Decompression of this distended bowel is necessary, and here an enterostomy and the vacuum decompression of Wangensteen are of the greatest service.

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THE VALUE OF X-RAY STUDY IN ACUTE BOWEL OBSTRUCTION

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Thanks to advances in the operative technic and post-operative management of abdominal surgical cases, a notable decrease has occurred in the incidence of post-operative ileus, but as long as surgeons have to deal with intra-abdominal and pelvic purulent processes, occasional cases of post-operative acute obstruction will be encountered. In addition there is a large group of cases of ileus associated with acute inflammatory processes, internal herniations, strangulations, volvulus, infarcts, intussusception, pressure from tumors, impaction of gall stones, food impaction, etc.

In suspected obstruction of acute onset in any case, we are often called upon for roentgenological aid; also when the history indicates the recent occurrence of one or more attacks of a transient nature suggesting ileus, and where the physician

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is unwilling to meet further similar attacks without making every possible effort to establish the cause. The surgeon who opens the abdomen of a patient suspected of having an acute intestinal obstruction expects to find dilated coils of bowel, usually small bowel, containing considerable gas or fluid or both. The gravity of the situation is determined largely by the diameter of the dilated intestinal coils and by their integrity. The operator may even content himself with doing a simple enterostomy on the nearest dilated loop as a life-saving procedure without pursuing the surgical exploration to the point of ascertaining the exact cause of the emergency. The absence of dilated coils of bowel will cause the surgeon to feel that the pre-operative diagnosis of acute ileus was incorrect. Here we have a basis for roentgenological aid in the diagnosis of acute obstruction. Before deciding to operate, it is expedient to establish at least the fact of obstruction. In the opened abdomen the fact is proved by finding widely dilated coils of bowel. It is quite possible to learn of the presence or absence of small intestinal dilation, and to establish the presence or absence of a colonic obstruction, without opening the abdomen if we use the roentgenological means available today in every hospital, no matter how small.

The implements required are simple: a portable or bedside roentgen ray apparatus; a film-holding cassette equipped with double screens; and facilities for film development. No preparation of the patient is required, not even rearrangement of the bandages or dressings. Usually, in cases of small intestinal obstruction, no opaque meal is required or desirable, the diagnosis being made from the scout film. The patient is not turned upon the abdomen with face down; the film-holding cassette is slipped underneath the patient as he lies supine.

The interpretation depends upon the study of the gas areas within the abdomen, supplemented when required by the administration of opaque material by mouth or by enema. Gas is very easily recognized; and by the study of the abdominal gas collections as to form, location, contours, etc., one may decide whether the small intestine is dilated to a degree sufficient to warrant a diagnosis of acute obstruction. This is also true to some extent in chronic obstruction.

The writer's first roentenograms illustrating the value of bedside roentgen ray studies in cases of suspected ileus were offered in the scientific exhibits of the American Medical Association and the American Roentgen Ray Society in 1911, and in various subsequent meetings of the same societies. His first publication occurred in 1914 in his four-volume Atlas of Stereoroengenograms of the Digestive Tract, published by Southworth.[1] His first paper before a medical society on the subject was read in 1915 at the San Francisco meeting of the American Medical Association,[2] with subsequent publications in 1920,[3] 1922,[4] 1923[5] and 1927.[6] G. Schwarz in 1911[7] and 1912[8] wrote several papers on the diagnosis of chronic small intestinal obstruction. Stierlin,[9] Kloiber,[10] Weil[11] and numerous others have since written on both acute and chronic intestinal obstruction, and Guillaume[12] in 1922 wrote a book on the subject, using the writer's technic and some of his illustrations. Meyer and Brams[13] have reported definite help from the roentgenological study of acute intestinal obstruction. It has become a routine in many hospitals in this country to subject every obstruction suspect to x-ray study, at the bedside if required.

The technic is very simple. The patient is carefully lifted on his draw-sheet while a film cassette is placed beneath him in such position as to show the abdominal area. He is not turned upon his face but is left as much undisturbed as possible in the supine position. The x-ray tube of a bedside apparatus is adjusted over the patient's abdomen, and, in a second or half second of suspended respiration, the exposure is made. The cassette is withdrawn and the patient left without having been disturbed any more than for a catheterization, not half as much as in changing the bed linen. Within ten minutes the film may be studied and the question of obstruction settled or further examination indicated.

Up to this moment no opaque material has been given, although, if there are necessary delays in arriving at a decision, it is the writer's experience that no harm results from giving 10 to 20 grams of barium sulphate in a water and lactose or glucose mixture. A very little will suffice. It may be given even in the presence of fecal vomiting, if there is delay in operating. Subsequent films may be exposed at intervals of a few hours until a decision has been reached. It may be useful (in order to show up fluid levels in dilated intestinal coils) to turn the patient on

one side and place the film vertically against the back or the abdomen, passing the rays through the body horizontally, that is, in a direction parallel with the floor.

Acute intestinal obstruction may be considered roentgenologically under two main classifications, 1. whether shortly post-operative or 2. not immediately if at all post-operative. The former group is characterized by a much greater quantity of intestinal gas which in the latter group is often absent to such an extent that it deprives the roentgen study of some of its value.

Every case of either group should have a large film made of the abdomen as a scout or exploratory study. From it may be noted whether there are coils of gas-distended bowel. They are significant according to contour and location. In general, gas in the periphery of the abdominal area is colonic, whereas centrally placed gas collections are more likely to be jejuno-ileal. Frank haustral markings indicate colonic gas. Smooth, unhaustrated, especially finely serrated, contours indicate small intestine gas. Often there are transverse striations across the gas pockets corresponding to the valvulae conniventes which the writer has termed the herring-bone or ribbed aspect; it is, of course, characteristic of small bowel. Also characteristic of small bowel is a parallel arrangement of the intestinal loops, the step-ladder arrangement so characteristic of ileus, as emphasized by Treves. Gas in the stomach is easily recognized. Often the complete outline of the distended stomach and its peristaltic waves, as well as the pyloric sulcus and the duodenal bulb, are outlined by the gas in contrast to the gray abdominal shadow; its position is usually characteristic of the stomach. The diameter of the gas-visualized coils is significant and of just the same value as the size of these coils noted through an abdominal incision.

Normally there is no gas in the small intestine, at least not in quantity sufficient to be recognized on the roentgenogram. In aerophagia and in certain states of chronic small intestine stasis not due to any organic obstruction, gas found in the small intestine presents a characteristic appearance: numerous small, irregularly-spaced gas areas, giving to the central portion of the abdominal shadow the reticulated or web-like aspect which is in distinct contrast to the gastric and colonic gas collections and to the shadows of gas in the dilated coils of acutely obstructed small bowel.

A certain amount of gas distention of the small intestine may not be of decisive importance but when the estimated diameter of the small intestine coil approaches four or five centimeters the diagnosis of ileus is self evident. The demonstration of a step-ladder arrangement of intestinal coils having finely serrated or smooth contours and especially when associated with the herring-bone appearance leaves little doubt as to the presence of ileus.

In order to satisfy himself as to the significance of such shadows found in patients with abdominal distention and other signs suggestive of ileus, the writer early in his investigations of this subject examined a series of one hundred post-operative abdominal cases on the first, second and third post-operative days by films made at the beside in the same manner described above. Many of them made no complaints, their convalescence being ideal. In others gas pains were disturbing but in none was a post-operative obstruction seriously considered. The surgical work had been carried out as gently as possible with a minimum of handling of intestine, often none at all, and with a minimum of abdominal or pelvic packs (gauze packs). This experimental work was done shortly after the work of Whipple and his colleagues, who showed us that the use of laxatives for pre-operative preparation in abdominal surgery favored the development of intestinal gas as a disturbing factor during the operation and in the post-operative period; so none of these patients had had laxatives, yet the majority of them showed more or less gas distention of the intestine, both in the small intestine and in the colon. It seemed evident that even the gentlest abdominal surgery, perhaps even mere opening of the abdomen, may be sufficient to cause a certain degree of ileus, which we assume to be paralytic in nature. But when intestinal coils assume the parallel arrangement and a menacing diameter, then the determination of the fact by simple x-ray study takes on much value. If the colon is distended by gas, whether or not small intestine coils are seen to be distended, enemas should be given to dislodge the gas from the colon if possible. Most cases of distressing post-operative abdominal distention are due to colonic gas, the passage of which can be materially aided by the introduction of the

colon tube and, if needed, a small enema of weak soap solution or a diluted gylcerine enema. The colonic gas, once expelled, the rest of the abdomen can be more carefully studied for small intestine gas collections. Any gas-visualized loop of small bowel, even only a few centimeters in length, if it measures four or five centimeters in diameter, and especially if it is ribbed, is highly suggestive of ileus.

The majority of cases of acute intestinal obstruction are due to lesions of the small bowel rather than of the colon, but a persistent accumulation of gas in the colon, not relieved by enemas, may be suggestive of acute colonic obstruction due to one of the causes which will be enumerated later.

When the diagnosis of acute ileus is clearly established by characteristic findings in the scout film, no further x-ray studies are required. The differentiation between paralytic and mechanical ileus is not a matter for x-ray determination; it is suggested by the history, the presence or absence of intermittent gas pains or visible peristalsis, and especially by oscultation of the abdomen.

However, the presence of gas in the obstructed coils is a sign often lacking. The obstructed bowel always contains a certain amount of fluid and sometimes too little gas is present to be of diagnostic value. This condition obtains especially in cases which are not immediately postoperative. The obstruction has supervened painlessly at first, later with intermittent cramps, still later the pain may disappear, for probably every case of mechanical ileus sooner or later becomes paralytic unless relieved. Even under such circumstances a ribbed or herring-bone appearance may be noted.

Thus far, an effort will have been made to omit the use of opaque ingesta. Some have felt it positively dangerous to administer barium or other mixtures of any kind by mouth as constituting additional risk to the patient. The writer has never so considered it. If obstruction is not present the small quantity of barium employed passes on without disturbance, whereas if obstruction is present, not only will it be removed following the operative intervention, but its presence in the bowel will serve to identify and differentiate the loops above the obstruction from those below. Its presence within the intestine can be readily recognized by inspection of the bowel in the opened abdomen. A very small quantity of barium or bismuth suffices for the study—a heaping tablespoon of the powder stirred in water and fed to the patient in tablespoonful doses or through a tube.

However, since even this explanation does not serve to allay the fears entertained by some that the barium may cause additional risk, the writer has lately adopted the use of "umbrathor," an aqueous solution of thorium dioxide, as the opaque medium for oral use and in many cases for rectal injection. This aqueous solution never precipitates.

Generally it is expedient to employ the barium or other forms of opaque enema first, to exclude the colon as the seat of the obstruction. It often happens that marked small intestine distention, even of the entire small bowel, occurs secondary to obstructive lesions well along in the colon, even in the sigmoid. A case of small intestine distention of enormous diameter was found to be secondary to carcinoma of the middle of the transverse colon. Another case was found to be due to torsion of the cecum; still another to volvulus of the sigmoid. Naturally, in these lesions of the colon there is seen in the x-ray film not only the small intestine dilation but also the gas distention of the colon proximal to the site of the obstruction. It has often occurred that films of the enema-filled colon showed coils of small intestine with the characteristic parallel arrangement sought as the definite proof of the fact of ileus when on the scout film these parallel coils could not be discerned.

There are numerous instances when both the scout film and the opaque enema fail to show sufficiently convincing evidence that an acute obstruction is present; the surgeon or the attending physician or the family protestations against further intervention may all combine to cause delay in deciding definitely for surgery. Under such circumstances it is quite justifiable to give opaque materials orally, especially when umbrathor is employed. The presence in the bowel of this opaque substance does not militate in the slightest against the patient's chances of recovery. It may be administered even in the presence of fecal vomiting, as if there could be much doubt under those circumstances. It is practically impossible for a patient by vomiting to evacuate anywhere near completely the opaque materials introduced into the stomach by spoon

or tube. Often we have made observations on patients in whom a barium meal had been given, followed by efforts to wash out the opaque materials from the stomach. We have found it practically impossible to get rid of the opaque salt by gastric lavage. In this connection it may be recorded that in doing cholecystography it has been a frequent observation that orally administered gallbladder dye has been returned, sometimes by repeated attacks of nausea, retching and emesis; yet in such cases we nearly always find that sufficient dye has remained in the stomach for diagnostic purposes and a good gall bladder shadow has been obtained unless there was some pathological situation preventing visualization of the gall bladder. In the suspected obstruction cases, with severe vomiting, opaque material introduced into the stomach soon finds its way into the small intestine, and eventually, according to the site of the obstruction, we note the obstructed coils beautifully visualized, with the characteristic transverse ribbing and contour serration.

After all, the main object of the roentgenological study in cases of suspected ileus is to exclude ileus or to establish the fact of ileus. Lack of conviction that ileus is present is the chief deterrent of early operation for relief of obstruction. Hope persists that the distention may be relieved spontaneously or as the result of the use of enemas or pitressin. Precious time may be lost unless operation is proceeded with. Demonstration of the fact of ileus is the important thing. With this fact assured, the surgeon will then be enabled to decide on the form of treatment. The site of the obstruction is of importance, of course, but less vital than the demonstration of the existence of the stenosis.

High obstructions are usually found when the small intestine coils of distention are confined to the upper abdomen; generalized small intestine distention indicates an obstruction low in the ileum or even in the colon. The history of previous operations may point to the operative field as the likely seat of the obstructive lesion, even though the operation occurred years before. Internal herniations, ileitis, intussusception, tumor, volvulus, Meckel's diverticulum, diverticulitis of the colon, are the more common causes, but most frequent is an adhesion of some normally movable coil of bowel, especially small bowel, to a fixed structure or to the stump of some structure which has been removed, such as a loop of ileum attached to the uterus at the site of a myomectomy, to the stump of a tube, to an ovary after some local cyst removal, or to the abdominal wall at the site of an incision, especially if drainage has been utilized. One case revealed small intestine herniation alongside the emerging loop of bowel in an inguinal colostomy.

Summary: Once more the writer emphasizes an important test of acute intestinal obstruction, available through bedside study with the x-ray. The examination made at the bedside disturbs the patient very little; no dressings are removed, the patient is left supine, or at most is turned only on one side. The information is immediately available. Usually no opaque medium is given, though it may be used with profit and without harm, especially if one uses the aqueous solution of thorium dioxide (umbrathor) in place of the ordinary barium sulphate suspension. An oqaque enema is often helpful. The chief value lies in the ability to determine by roentgen ray study the existence of dilated loops of bowel; to differentiate gas in small bowel from colonic gas; to estimate the actual caliber of the intestinal loops thus visualized; but mainly to confirm the fact of ileus before proceeding to surgery.

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THE SURGICAL TREATMENT OF ACUTE INTESTINAL OBSTRUCTION*

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The treatment of acute intestinal obstruction is surgical. John B. Murphy's old and often repeated statement, "procrastination is the greatest and most frequent error in surgery," is especially true for this condition. Murphy's dictum in the presence of an intestinal obstruction was "get in quick and get out quicker." The heavenly roster has received few persons dying from unnecessary exploratory incisions, but its pages are crowded with those whose explorations were tardy or neglected. When the intestine is mechanically obstructed early exploration is demandatory. True, the vigilant surgeon must carefully evaluate in his operative approach the general condition of the patient, the period of time elapsed since the onset of symptoms, the cause and location of the obstruction and the extent of associated changes both locally and generally as manifested by the symptoms and blood of the patient.

Acute intestinal obstruction makes the alternative of death or surgery. The surgical procedure of choice is performed with the patient adequately prepared preoperatively and designed first, to relieve distention and other acute symptoms; second, to disrupt the etiological cause of the obstruction and restore the continuity of the gut and third, to rehabilitate the patient from toxemia and shock.

Immediate surgery does not prevent preoperative preparation of the patient. Dehydration is alleviated by the intravenous or subcutaneous administration of two and one half to five per cent glucose in normal saline in quantities ranging from 3,500 to 5,000 cubic centimeters in twenty-four hours. The transfusion of from 250 or more cubic centimeters of blood is often a necessary initial and repeated procedure to combat shock. This is especially true in the presence of intestinal strangulation with resultant intra-abdominal blood loss or when the systolic blood pressure falls below 100 millimeters of mercury accompanied by a pulse that remains rapid and of poor quality despite the adequate administration of glucose in normal saline. Intranasal oxygen in a 95 per cent. dilution administered at the rate of four to six liters per minute is employed to decompress the bowel and to detoxify and conserve the intestinal muscle tone as well as to relieve the respiratory mechanism. The recognized value of continuous, controlled siphon-decompression of the stomach and small intestine in the manner of Wangensteen or Miller and Abbott used both as a preoperative and postoperative measure cannot be too strongly emphasized. For this procedure the lead tipped, multiple perforated tube of Wangensteen or the special Miller-Abbott intubation tube is most serviceable, and in certain cases of simple obstruction due to adhesive bands (six to ten per cent.) this treatment alone may effect their recovery. In the absence of peritonitis rectal siphonage partially relieves the patient and prepares the lower bowel for surgery. The signs of successful decompression are: cessation of colicky pains, diminution of fluid aspirated per suction, less distention and a possible passage of gas into the lower bowel. With the foregoing operative preparation and the location of the obstruction accurately determined by a correlation of history, symptoms, flat supine x-ray of the abdomen and occasionally a thin barium enema, the patient is ready for surgery.

The worth of a trained physician-anesthetist in operations such as these has been repeatedly proved. The method of choice is well-controlled general anethesia. General preference is probably nitrous oxide or cyclopropane reenforced with ether, supplemented by local infiltration of procaine. It is true that spinal anesthesia, especially metycaine, has certain anesthetic and physiological advantages that at times demand its use. Preanesthetic medication for the average adult patient is one-eighth to one-quarter grain of morphine combined with one, one-hundredth grain of scopolamine. The barbiturate group when judiciously and skillfully combined with the preanesthetic medication produces mental placidity, relieves pain and reduces the necessary amount of general anesthesia. During the anesthetic continuous duodenal suction is maintained, and after the induction of the anesthesia, perioral glucose in saline may be started.

The success of surgery in intestinal obstruction is founded upon the adaptation of the procedure to the condition present in each individual case. Thus when a localizing diagnosis has been made as to the nature and location of the lesion,

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the best possible incision for the exposure of the pathological condition can then be made. However, if localization has not been possible an exploratory operation must be undertaken. A mid, right-rectus incision is generally most satisfactory as it provides exploratory access to the entire bowel and operative access to all except the colon distal to the midpart of the descending portion. Obstructions of the pelvic colon with resulting "closed loop" distention are most satisfactorily relieved by a short right-sided incision through the rectus muscle and directly over the transverse colon, although cecostomy or ileostomy at other sites may be performed. The operative incision of choice for the performance of a low enterostomy is a vertical one on either side of the linea alba. In the event that the pathogenic condition absolutely necessitates a high enterostomy, a left-rectus incision is most serviceable, although an indwelling duodenal tube with suction frequently effects a decompression equally as well. Pelvic colostomy is best done through a short, mid-line, left-rectus incision, while the attack on other portions of the colon must be adapted to the region and the nature of the obstruction. Incisions through or in close proximity to scars of former laparotomies are always to be avoided.

The wise selection and meticulous execution of a desirable operative procedure that takes into careful consideration the nature, location and extent of the obstruction is an absolute surgical requisite. It has been pointed out that early operation is necessary to reduce mortality. The terms "early" or "late" as used herein refer not to hours but to the degree of distention present and the patient's general condition. The types of mechanical obstruction with which the surgeon will have to deal are those interfering with the bowel's circulation causing strangulation, and those interfering with the bowel's continuity but not primarily involving circulation. After surgical exploration, the surgeon must have answered the following questions: Is the obstruction high or low? Is the obstruction early or late? Is the obstruction simple or strangulating? Is the bowel viable or nonviable? Can a procedure of election be done or must an emergency measure be instituted? The operator must always be guided by the dictum that the procedure to be selected is the one that will give the patient the greatest relief with the least risk. The surgeon's primary purpose in an emergency operation is to save life by aseptically decompressing the bowel and preserving its viability so that its continuity may be restored. To do this, the surgeon has at his disposal the following operative procedures in dealing with obstructions of any type: 1. Simple mechanical release of early incarcerated bowel or strangulated herniations. 2. The disruption of constricting bands or adhesions. 3. Simple enterostomy or colostomy. 4. Excision of the obstructed bowel with the reestablishment of its continuity. 5. Exteriorization with formation of an immediate or delayed fistula. 6. Entero-anastomosis about the obstruction. The patient's condition and the bowel's viability are the two factors that most profoundly influence the surgeon's choice and manner of procedure. If the viability of the gut as established by its color, state of mesenteric vessels and its contraction reaction to pinching is questionable, it should be treated as being dead. In certain situations an adhesive band or bands will be found to be producing the obstruction, and if discovered early these may be carefully divided. Caution must be exercised, however, as leakage has repeatedly followed this procedure. Too infrequently the surgeon elects to do enterostomy when it is the procedure of choice. By this is meant the surgeon all too often divides bands, breaks up adhesions and does manipulations and procedures which indirectly condemn the patient to death when a simple enterostomy would have preserved life and permitted a later establishment of intestinal continuity. It must be pointed out here that one of the most important recent advancements in gastrointestinal surgery is the surgeon's acceptance of the advisability of multiple operations.

Enterostomy is a most useful operation and probably has a more extensive application in the treatment of mechanical intestinal obstruction than any other single procedure. Its success, whether performed upon the exceedingly ill patient or the good risk, is dependent upon sound surgical principles aseptically carried out. Its use is indicated when immediate decompression is necessary to prevent the distention of the bowel from mechanically damaging the wall with resulting toxic absorption, perforation or circulatory embarrassment with loss of the bowel's viability. Likewise, when a rapid and complete decompression with the release of toxic material

followed by moderately early administration of oral fluids is desired, enterostomy serves well. Consequently its use in late simple obstructions as produced by single adhesions or bands, in guarding semi-devitalized gut as after the reduction of intussusception or volvulus, in protecting suture lines as following anastomosis or foreign body removal, in persistent paralytic ileus or obstructing spastic ileus, enterostomy is found to be readily executed by the surgeon and well tolerated by the patient. The technic of temporary enterostomy is that of Witzel or a modification therof such as Linton's procedure.

Seldom does entero-anastomosis have a place in the treatment of acute intestinal obstruction as its execution carries a great operative risk. Its use always precludes that the bowel is completely viable and that the obstruction is at the moment irremovable. Thus its selection is mainly reserved for non-acute obstructions high in the small bowel. Conceivably, it has a primary place in the emergency treatment of a malignancy, an obstructing benign growth or dense occluding adhesions occurring high in the jejunum. The fate of sidetracked loops with resulting distention and untoward symptoms also tends to condemn this procedure.

When the operator encounters frankly devitalized gut, his only surgical alternative is exterioration or primary resection and anastomosis. The latter procedure is usually to be strictly avoided as an emergency measure, but when the surgeon encounters completely devitalized bowel due to mesenteric thrombosis, gangrenous volvulus or irreducible intussusception, resection is advisable. At times the surgeon may elect to do a resection and anastomosis in several other types of obstructions, but the patient and the morbid condition must be favorable.

On the other hand, exteriorization has a very useful and wide application. True, its use in the upper small bowel area is to be avoided. Even in the face of these facts, exteriorization for this region may be done if the digestive fluids escaping from the proximal bowel fistula are transferred directly or indirectly to the distal fistula. Exteriorization also permits bowel aspiration directly at the point of obstruction. In those cases with non-viable gut which will not tolerate even a modest surgical procedure or when possibilities of grossly contaminating the peritoneum exists, exteriorization offers a rapid, easy and certain method of obstruction relief.

As has been pointed out, resection with primary anastomosis is sometimes the procedure of choice or necessity. Failures resulting when this method is used, arise primarily from the lack of aseptic technic and not excising widely enough at the area to be resected. On the proximal side of the obstructed bowel it is necessary to resect a segment at least six to eight inches from the devitalized area. On the distal side it is usually sufficient to divide the bowel three inches from the site of embarrassment. It must be remembered that when the bowel is opened in a primary procedure that immediately returns it to the abdominal cavity, the mortality tends to rise sharply. The content of an obstructed bowel loop is highly infectious and any portion of the intestine being opened under these circumstances should be carefully packed and isolated from other bowel loops. Bowel walls that have become very thin from prolonged distention should be completely deflated between clamps and allowed to regain wall tone by wrapping the area in very warm packs for three minutes before any operative procedure is attempted. The presence of possible contamination even before actual operative manipulation must be considered, in which event the process of mechanically cleansing the bowel externally with a one per cent. solution of sodium ricinoleate as after Wangensteen, is to be recommended both as a cleansing agent and as a possible preventative of adhesions.

The most frequent cause of acute intestinal obstruction arises from the gut becoming strangulated in an internal or external hernial opening. The former is of rare occurrence, but the frequency of strangulation in inguinal, femoral and umbilical hernias calls for clear surgical concepts. In general, their non-surgical reduction by manual manipulation is dangerous and to be avoided. For inguinal and femoral incarcerations, early operation carried out through a hernial incision and designed to divide the band causing the strangulation is in order. If the band has produced only a ring-like area of damage, the area may be inverted by a fine line of sutures, more extensive damage in good risks will permit resection and primary anastomosis. Poor operative subjects best tolerate exteriorization and proximal enterostomy. Strangulated internal hernias are often difficult to identify; once found,

however, a two-stage procedure designed first to relieve obstruction and later to appropriately correct the hernial defect is carried out.

Foreign bodies not infrequently obstruct the bowel and necessitate the surgeon's attention. The most frequent offending agents are gallstones, large fecaliths, ingested foreign bodies and worms. Meconium may obstruct the bowel in the newborn. At times the site of obstruction may be complicated by the bowel tending to twist or roll upon itself, producing a rather wide area of damage. Operation is demandatory and the procedure is adapted to the morbid state present. Stones or other foreign bodies may at times be displaced proximally away from the damaged and obstructed site into a healthy area of gut and there crushed, or in the same manner the object may be displaced, isolated between clamps and the bowel incised and the body extracted. Not infrequently less risk and fewer operative difficulties are occasioned by the exteriorization of the loop of gut containing the foreign body. In this manner, after the skin has been closed, the foreign body may be removed and the incision in the bowel closed or enterostomy performed. Later the bowel may be dropped back into the peritoneal cavity when the convalescence of the patient is absolutely assured.

Intussusception is a strangulating condition most common about the ileocecal region occurring mostly in infants of weaning age. Certain cases have been conservatively reduced under x-ray visualization, being guided by a barium media, but surgery still remains preferable.

Volvulus of the bowel produces torsion in a clock-wise direction which when exposed early requires simple untwisting, although when distention is present this procedure may require decompression of the gut by means of a large needle. In late involvements with devitalized bowel excision or exteriorization must be selected. When more than four feet of the small intestine is involved, primary resection and anastomosis is to be chosen. However, extensive damage to the large bowel calls for exteriorization and proximal colostomy. In all resecting operations the mesentery is saved and wrapped about the suture lines, thereby preventing leakage, establishing circulation and curtailing reoccurrence.

An adynamic or paralytic type of ileus may arise as a result of over-active sympathetic nerve influence and is characterized by a rapid distention of the major portion of the intestinal tract. These obstructions of nervous imbalance respond best to continual duodenal suction and rectal siphonage. Enterostomy is to be considered only when all other measures have failed. Heat to the abdomen and lumbodorsal area is of considerable worth, and the careful use of smooth muscle stimulants frequently give relief. Oxygen administered intranasally at times produces marvelous response. The stimulating effect of 100 cubic centimeters of 15 per cent. intravenous saline solution upon the bowel's peristaltic movements must also be mentioned as well as the relief occasioned by spinal anesthesia.

Dynamic ileus, or perhaps more descriptively spastic ileus, is usually relieved by duodenal suction, rectal siphonage, heat to the abdomen and anti-spasmodic drugs. In the face of great distention proximal to the spastic obstruction, enterostomy under spinal anesthesia must be resorted to. Spastic ileus predisposes the bowel to intussusception and has a tendency to reoccur—a condition best coped with by sympathectomy.

Hirschprung's disease not infrequently produces fecal obstructions of the lower bowel. This condition is best treated following the failure of enemas to provide relief by colostomy. When surgical preparation is possible sympathectomy is the procedure of choice.

Imperforations of the anal canal and rectum with their various diseased conditions calls for proctoplasty or for colostomy with later plastic closure.

CONCLUSION

In the postoperative treatment of intestinal obstruction the surgeon must realize that obstruction occasions two profound disturbances; namely, distention and the loss of body fluids. This causes the patient to be especially prone to surgical shock following operation, and the surgeon's primary concern is to the state of the circulation. Shock is best prevented or combated by preserving the patient's body heat, elevation of the foot of the bed, assisting in frequent changes of posture, encouraging movement of the body and extremities, insisting upon and helping in deep breathing periods, the inhalation of carbon dioxide and the administration of intranasal oxygen. The latter measure combined with continuous duodenal decompression is the surgeon's most efficacious means of

combating postoperative distention. A completely decompressed bowel will prevent, in a large measure, the possibility of perforation, of toxic intra-intestinal absorption, of adhesion formation, of paralytic ileus and of vomiting as well as the protection of suture lines. The restoration of fluid balance and the establishment of a source of chemical and nutritional intake by means of perioral glucose in normal saline is of paramount importance. At times, a blood transfusion or intravenous acacia solution is demanded before the more profound symptoms of shock are combated. It must be emphasized that fluids by mouth before the intestines have regained their normal peristaltic tone frequently cause the surgeon much avoidable concern and not infrequently the patient's death. Consequently, fluids when first permitted thirty-six to eighty-six hours after surgery, should be limited to warm salt water only, later weak sweetened tea and finally a more generous intake may be had.

Pain, when present, is probably best controlled by substantial hypodermic doses of codeine or the barbiturates administered intravenously or rectally. It must here be mentioned that morphine tends to stimulate the activity of the small bowel with an inhibiting effect upon the large portion, which contrasts with the stimulating action of pituitary substances upon the large bowel.

Cathartics have no place following this type of operation as after five to eight days American oil administered by mouth provides the most physiological evacuation. Other medical measures are facilitated by laboratory indices such as blood chlorides, introgen and carbon dioxide levels. Postoperative distention must constantly be guarded against and dealt with as outlined in the treatment of paralytic or dynamic ileus.

Again I repeat that the mortality resulting from intestinal obstruction can be lowered only by an early, accurate diagnosis with prompt surgical intervention that combines sound operative judgment and meticulous technic with wise pre and postoperative care.

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STRABISMUS

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CHICAGO

The subject, "the care of cross-eyes," which has been selected for this section, is not intended or expected to supplant well-accepted methods of procedure which have been successful, but not 100 per cent., for the last half century or more. Many surgeons pursue a method which they have selected as satisfactory to them for so many years that they believe their method cannot be improved upon. This paper offers suggestions which may be of interest to general practitioners as well as ophthalmic surgeons, and may assist many unfortunate cross-eyed patients who have not received 100 per cent. good results.

There are three good reasons for presenting this subject:

First: To stress the early non-surgical or preschool treatment of squinting children.

Second: To suggest bifocal glasses for squinting children when necessary.

Third: To emphasize orthoptic treatment before and after surgery.

When should treatment begin? This question should be answered by the positive statement that non-surgical treatment should begin with atropine as soon as the squint appears.

In a given case, the history should include age, the kind, duration and amount of deviation of the squinting eye. If, under atropine, the result

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is satisfactory by the use of distance glasses, or Number One, all concerned are satisfied.

If the result is not satisfactory by the use of distance glasses, or Number One, then Number Two, or bifocal glasses with large inverted segments are prescribed. Segments of plus 2.50 D or plus 3.00 D, or a trifle less, are added to the distance correction to abolish accommodative effort even though the distance correction is little,

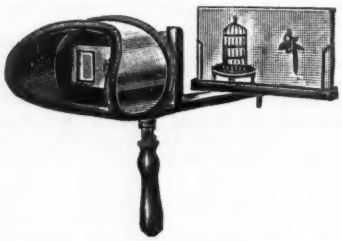

Fig. 1. Bird and Cage—New Era Optical Company, Chicago.

or even if the refraction is normal under atropine.

When the result is not satisfactory after the use of Numbers One and Two, Number Three, or orthoptic training, is added to what has already been done. Much can be accomplished with almost any kind of a stereoscope and a set of prisms. The bird and cage (Fig. I) is quite attractive to children when trying to put the bird in the cage. (More elaborate instruments are reported in this paper.)

If the result is not satisfactory after Numbers One, Two and Three have been given a fair trial, surgery is indicated, but not until the child is cooperative enough to have the operation performed locally. Orthoptic training is always begun a few days after surgery is done.

Amblyopia is not infrequent in squinting children and often disappears when proper glasses are worn, but if it persists some form of occlusion is recommended, and one of the best and most agreeable to the child is easily accomplished by placing enough soap on the outside of the glass of the best eye to make the amblyopic eye the better of the two.

Bifocal glasses in children, a very important subject, is scarcely mentioned in medical literature, but it is cheering to know that our own Drs. Guibor and Gifford have recently been prescribing bifocal lenses for squinting children in their clinic at the Northwestern University of Chicago. The late Dr. George A. Suffa of Boston originated the practical use of bifocals in children (Transactions of the American Homeopathic Ophthalmological, Otological and Laryngological Society, 1913) and his method has been used continuously for twenty-five years by Dr. Burton Haseltine of Chicago, who has added many practical improvements in the making and adjusting of bifocal spectacles for squinting children one of which is the very large inverted segment for close work. (Fig. 2)

Orthoptic Treatment of Strabismus. By the orthoptic treatment of strabismus is meant the

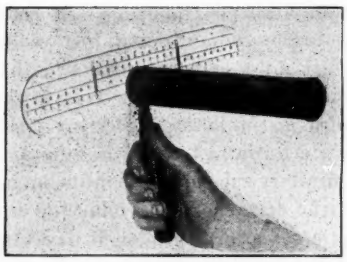

Fig. 3. Hand Diploscope—Cantonnet's Book.

re-education of the ocular muscles so as to bring about normal fusion with correct binocular and stereoscopic vision.

In the United States scientific orthoptic treatment is comparatively new. Leading textbooks of ophthalmology devote but little space to the subject; Fuchs' "Textbook of Ophthalmology" (Douane), 7th ed. 1924, and 10th English ed. (Brown) 1933, refers only slightly to orthoptic training,

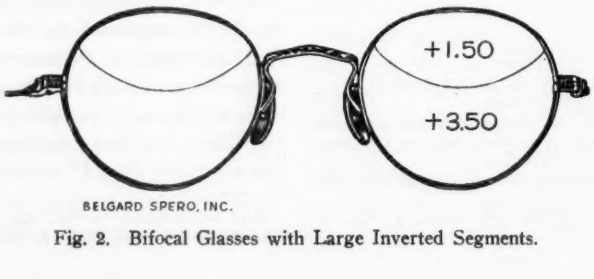

Fig. 2. Bifocal Glasses with Large Inverted Segments.

but admits the value of stereoscope and amblyoscope in educating the fusion faculty. One of the most recent large text-books, that of Berens, 1936, "Eye and Its Diseases," also gives only a small space to orthoptic treatment of squint but states that some amount of orthoptic training is essential both before and after operation. Howard's book, 1937, and Gifford's book, 1938, give good but brief descriptions of their methods of

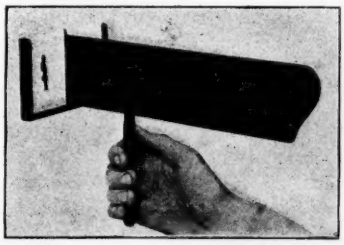

Fig. 4. Rémy's Separator—Peter's Book.

orthoptic treatment. May in "Manual of the Diseases of the Eye," 1924, describes the amblyoscope, and in the 1937 edition adds the cheireoscope and the synoptophore, and gives a good but very brief description of orthoptic training. Parsons in "Diseases of the Eye," 1936, gives a short description of the manner in which he uses the stereoscope.

Ambroise Paré, in the sixteenth century, at-

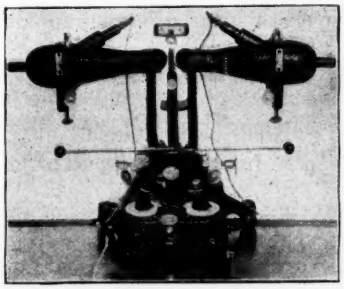

Fig. 5. Synoptophore—Peter's Book.

tempted a form of occlusion by causing squinters to wear a mask on the face with a central perforation in front of each eye to induce the visual axes to become parallel. In modern times the first mechanical arrangement which was used to attempt straightening of squinting eyes was Wheatstone's stereoscope, introduced 100 years ago in 1838. Modern orthoptics is really a French development as Javal, who may justly be called the father of orthoptics, was the first to lay down and systematically practice definite stereoscopic exercises for the relief and definite cure of squint without surgery. His system is fully described in his "Manuel du Strabisme," published in Paris in 1863. About this time Donders and others were using lenses for the same purpose. Javal suggested the connection between binocular vision and the synergic action of the ocular muscles, and this book was the foundation of the physiologic orthoptic training for the cure of strabismus. The invention of Worth's amblyoscope was a great advance over the stereoscopic method of Javal; but the greatest and most enthusiastic protagonist of the orthoptic method was Albert Rémy, who worked at it continuously from 1901 to 1925 in Lapersonne's eye clinic in the Hôtel Dieu, Paris. Rémy invented the diploscope which he used constantly. At this time a cure of strabismus by orthoptic training

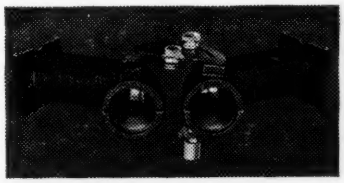

Fig. 6. Amblyoscope—A. M. Optical Company, Chicago.

alone was recorded as taking from three to five years.

Within recent years special orthoptic training departments, in connection with ophthalmic hospitals, have been established in England and in the United States, and to a lesser extent in Germany and other countries. In Germany, Hesse and Sattler were the most prominent advocates of orthoptic training; the latter used prisms, the amblyoscope and the special charts which are named after him. In Finland, Stenius obtained excellent results with the amblyoscope. In France and in England the method is extensively used. In the United States the best known exponents of the method are Peter, of Philadelphia, and Guibor of Chicago.

The various exercises in orthoptic training are designed, first, to develop rapid, steady fixation of the squinting eye and, second, to develop dynamic binocular vision, the latter being dependent upon an appreciation of the ocular move-

ments and innervation involved in seeing an object.

The results obtained in amblyopic eyes by continuous occlusion alone might be referred to here. Gifford states that those who practiced prolonged uniocular occlusion report the best result. Delord, with four to six months' occlusion, obtained improvement in vision in 35 cases; Peter reported 50% improvement; Herzau, in 41 cases, obtained 43% of improvement with occlusion of from one to six months. Bielchowsky thinks that the best results are secured if the occlusion is undertaken before the age of six years. As a general rule, however, it is very difficult to keep up prolonged occlusion in young patients. Bressler states that, in the Illinois Eye and Ear Infirmary, fusion was frequently developed in patients with vision in the amblyopic eye ranging only from 2/200 to 6/200. Paralytic squint, which is usually accompanied by diplopia, is not amenable to orthoptic or surgical treatment, but often corrected by internal medicine. Cantonnet thinks that in elderly subjects re-education is a waste of time. As a rule, after 30 or 35 years of age a subject cannot be re-educated with any hope of success. Also that, other things being equal, a better result will be

Fig. 7. Stereoscope—New Era Optical Company, Chicago.

obtained with a subject of 17 or 18 years than with a child of six or seven years, because the will and intelligence are better. Hansell and Reber and Maddox think that fusion can be developed in adolescents and young adults by orthoptic exercises. Rasquin and Onfrey in France express a similar opinion.

METHODS OF ORTHOPTIC TRAINING: Methods of orthoptic training in strabismus, representative of leading French, English and American Eye Clinics follow.

Fig. 8. Cheiroscope—New Era Optical Company, Chicago.

Cantonnet's Method. In the French method, as exemplified by Cantonnet and associates in the Albert Rémy School of Reeducation, Paris, the various steps in the orthoptic training are designed for the following purposes:

1. To correct as far as possible any refractive errors.
2. To conquer the amblyopia of the squinting eye.
3. To overcome neutralization.
4. To pass from simultaneous to binocular vision.
5. To obtain the sensation of relief (stereoscopic vision).

The orthoptic treatment is directed to forcing the amblyopic eye to function by de-neutralizing it in an intense light; the general rule is to bring the deviated eye to "fix" and try all means to get rid of neutralization at different distances; to help the neutralized eye by lowering slightly the vision of the fixing eye by using black and white colored patches in diploscopic exercises (Fig. 3). The diploscope was invented by Rémy and is only an elaboration of Wheatstone's stereoscope, the instrument used by Javal in his original orthoptic exercises. Both large and small

diploscopes are used—the small one for home use. In patients under the age of five years occlusion of the fixing eye is employed; above the age of five years, no occlusion, but diploscopic exercises only. Rémy's Separator (Fig. 4) is used for those who have reached the stage of simultaneous vision. This instrument was de-

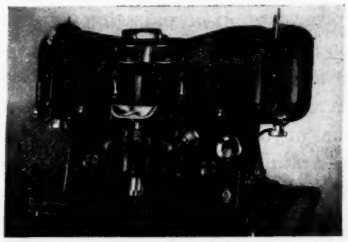

Fig. 9. Stereo-orthopter—A. M. Optical Company, Chicago.

signed for use at home and is used to break down suppression as well as to correct the over-convergence which occurs in accommodation in some cases of squint.

Cantonnet places great stress on the mental effort of the patient. To make a convergent squinter place his eyes in relative divergence he must be made to fix mentally a distant object placed above the plane of the horizon. "When we think of a distant object or of an object that moves from us our eyes place themselves in a state of relative divergence." Mental effort and synergy constitute the basis of the French method of re-education and the exercises are planned toward this. Prisms are indispensable for those who cannot make this mental effort.

English Method. As a representative English method, that of Dr. Margaret Dobson of the London County Council Orthoptic Training Clinic may be given. The training of strabismic patients is divided into three stages:

1. Improvement of the amblyopia of the squinting eye.

2. Enlargement of the restricted monocular field of fixation in the squinting eye and strengthening of the concomitant movements of the eyes.

3. Fusion training so as to obtain binocular vision in different degrees.

To improve amblyopia of the squinting eye refractive errors in each eye must be accurately corrected by lenses, prisms and concentrators. If the visual acuity is very poor and the squint more than 15°, it may be necessary to occlude the sound eye. When the vision in the amblyopic eye has been improved to 6/18, true fusion should be obtainable with the synoptophore (Fig. 5).

American Methods. The procedure followed by Peter and Guibor may be considered as typical of those followed in American orthoptic training clinics by physicians. The most essential phases in Peter's method in the Graduate School of the University of Pennsylvania, can be placed in the following order:

1. Correction of amblyopia at an early age.

2. Concentration with the synoptophore (Fig. 5) which is an amplified amblyoscope.

3. Judicious use of surgical intervention when necessary; such intervention renders orthoptic training easier and brings about a more prompt and more complete recovery.

4. Enthusiasm in all details of the work and an open and unbiased mental attitude as to results.

Guibor's method in the Northwestern University Orthoptic Clinic, Chicago, is outlined as follows:

1. An atropine refraction and determination of the type or class of strabismus.

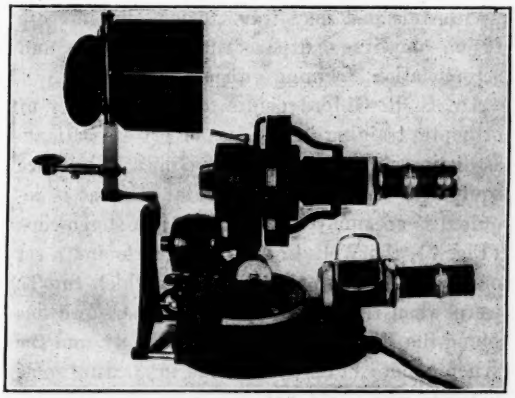

Fig. 10. Myologic Unit—Cameron Surgical Supply Company, Chicago.

2. A proper correction depending on the type of strabismus.

3. Improvement of the vision of the amblyopic eye.

4. Overcoming of suppression.

5. Production of binocular perception and superposition.

6. Production of fusion.
7. Production of stereopsis.
8. Training of fusion and amplitude.
9. Training of duction power.

Guibor states that suppression is the most important factor to be overcome in squint. It is accomplished in a number of ways; by increasing the illumination before the suppressed eye; by lessening it before the fixing eye; by placing large objects before the suppressed eye or smaller objects before the fixing eye; by the use of plain and colored charts. Wells, Sattler's, Worth's and Hamblin's stereoscopic charts are used. The detail of Guibor's general routine is as follows: At the first and second visits the child's history is taken and examination made to determine muscle balance, motility, fixing power and diplopia; the angle of anomaly is taken by perimetry. Tests are made to establish the presence or absence of binocular vision and the degree of fusion and its amplitude, also the strength of monocular vision. For these purposes the instruments used (as well as for treatment) are the amblyoscope (Fig. 6), stereoscope (Fig. 7), synoptophore (Fig. 5), and various charts. Prisms may or may not be used with the stereoscope. Guibor thinks that the instrument of most value in orthoptic training is the stereoscope (Fig. 7). "With this one may train fusion and increase fusion amplitude, disassociate convergence and accomodation, training either at will."

Dr. S. R. Gifford points to the feasibility of orthoptic training in the case of private patients as distinct from those visiting clinics. The office equipment need not be elaborate; all that is required is an amblyoscope (Fig. 6), a stereoscope (Fig. 7), the Wells and Sattler charts and a set of prisms for a small trial frame which can be worn when the stereoscope is used. Gifford has found the Maddox cheireoscope (Fig. 8), and the synoptophore (Fig. 5) of value in starting some patients who could not fuse with the other instruments. The Keystone drawing charts he considers are not of value until some fusion is present, but when this is accomplished they are of great stimulus. The office work is supplemented by home exercises in carrying out orthoptic exercises. The stereo-orthopter (Fig. 9), and the myologic unit (Fig. 10) are motor driven instruments which appeal to many. Booklets are furnished with them.

ORTHOPTIC TRAINING AND SURGERY FOR STRABISMUS: Most writers agree that in the case of strabismics who need surgical correction preoperative and postoperative orthoptic training is very beneficial. Pranger thinks that it is essential as a preparation for operation; the ability to possess some degree of fusion seems to insure a much brighter prospect for successful operation; also the state of disorganization which follows operation seems to be the ideal time of orthoptic training to obtain phoria and from thence to a better cure. Berens and associates, writing of the value of orthoptic preoperative and postoperative training, state that the development of fusion in 31 (69 per cent.) of their 45 operated patients with heterotropia, when six of the 45 were amblyopic, they believe to be a higher percentage of fusion than could have been obtained without preoperative and postoperative orthoptic training. Orthoptic training should be commenced after operation as soon as the eyes can be opened comfortably in eight to ten days.

SUMMARY

An endeavor has been made to describe the routine which I personally believe best, as well as the various methods of other workers, and to give their views as they are found in the literature. It is reasonable to suppose that a plain and simple approach to the subject will be appreciated, and believing this a method of treating cross-eyes has been recorded by some of the most prominent workers in the U. S. A., as well as those abroad. One can readily understand by this survey that many cross-eyes can often be straightened:

First, by properly adjusted distance glasses under atropine.

Second, by bifocal glasses with large inverted segments.

Third, by adding to the above orthoptic training.

Fourth, by surgery followed by orthoptic training.

Ophthalmic surgeons who are familiar with these four methods and practice them should have a larger percentage of satisfactory results than they would have if any one of the four was used alone.

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DISCUSSION

Dr. Burton Haseltine, Chicago: A better review of the literature or more comprehensive outline of the management of cross-eyes than Dr. Fisher has presented could probably nowhere be found. For purposes of clearness his outline of management is of course over-simplified. From his unusually rich experience he knows better than most of us that the clinical problem is not quite so simple. The individual case rarely fits snugly into any schematic frame, but Dr. Fisher's outline will come nearer to covering all cases than any previously presented. This is partly because it is the only one that mentions and assigns a proper place to use of bifocal lenses in the treatment of convergent strabismus. In view of his generous reference to my experience with the method, my discussion will be devoted chiefly to that topic.

The procedure was originally suggested by the late

Dr. George Suffa of Boston, from whom I obtained it in 1912, and it has been a constant and increasingly important part of my treatment of strabismus since that time. I regard it as the most valuable single contribution to this problem since the work of Donders. I therefore welcome Dr. Fisher's effort to make it better known. It is most regrettable that the method is not described in literature nor adequately taught in any school of ophthalmology.

The reasons for using bifocals in strabismus are so simple that most ophthalmologists, on hearing them stated, are surprised that they have not thought of them before. Knowing how the extra demand upon accommodation in hypermetropia prevents binocular fixation and fusion, it seems almost obvious that even normal accommodation effort could be a factor where fixation is poor and fusion impulse weak. Some recognition of this fact is common, as shown by the frequent recommendation to suspend accommodation by prolonged atropinization. But Suffa seems to have been the first fully to appreciate its importance and to think of this extremely effective device to meet the difficulty. His success with it was extraordinary from the first although not as complete as has since been attained with the finer optical work now available. The most important cause of failure in the use of bifocals for young children is that the near segment is not large enough. The bifocal segment as made for adults is almost useless for little children and failure to recognize this explains the indifferent success of a few men who have sincerely tried to apply the method.

It is fundamental that the first step in treating all strabismus is the accurate measurement and proper correction of the ametropia. In those few cases in which perfect binocular function results from this alone, bifocals are of course uncalled for. In the more numerous cases requiring other measures. Dr. Fisher lists bifocals as the first procedure to be employed and in this makes a distinct advance over the methods commonly taught.

One misapprehension which physicians often have on first hearing of the procedure should be clearly corrected; that is, that the bifocals are used in connection with or as an aid to prolonged atropinization. The opposite is true. The bifocals make unnecessary the use of atropine except for the measurement of the ametropia. Occlusion is rendered unnecessary in most cases and where it is required the time is much shortened—a most important consideration.

The use of atropine in the better eye alone is highly effective in improving vision in the amblyopic eye, while at the same time developing instead of hindering binocular function. It should be employed instead of occlusion wherever possible. Every hour that either eye is used alone delays and makes more difficult the development of binocular vision. Atropine in the deviating eye, except for measurement of refraction, is not only unnecessary but highly undesirable.

In this connection, another misapprehension should be corrected, namely, that ciliary spasm may be induced by the proper use of bifocals, whereas the very opposite is true. This error results from confusing the idea of an over-correction with the idea of bifocals. It is not uncommon to prescribe an over-correction of the hypermetropic error for distance wear in the hope that this will correct the convergent squint. This is a failure because it substitutes one refractive error for another, makes comfortable vision impossible and often serves only to maintain a spastic condition. The bifocals make possible the slight under-correction of hypermetropia which should always be prescribed, thus giving vision without strain both for distance and near work and the result is a prompt subsidence of both ciliary and convergence spasm without atropine.

To summarize the things to be accomplished by bifocals, not possible without them:

1. They make possible the establishment of parallelism and development of binocular vision several years earlier—and these are the most vital years in regard to eye function.

2. They make possible a controlled and graduated regulation of the amount of accommodation strain without any of the disadvantages of drug cycloplegia.

3. They remove the necessity for surgery in the majority of cases and greatly reduce the amount of orthoptic training required to obtain perfect binocular fixation.

4. They make possible much earlier discontinuance of occlusion.

Dr. F. M. Whitsell (Chicago): I deeply appreciate the honor accorded me of discussing this paper by Dr. Fisher but am cognizant of my inability to add anything of importance to it. The subject, old in respect of time, as our essayist pointed out, is nevertheless new because of the revival it has undergone in the past five years. Methods have become fairly well standardized in the various clinics in Europe and the United States, but opinions differ somewhat on such points as how long to persist in conservative measures before suggesting operative interference, how much vision the deviating eye must have in order to develop fusion, and how long to occlude one in order to increase vision in the other eye.

I am glad to learn from what we have heard, however, that fundamentals at least have been settled and all are agreed that the process must begin with a cycloplegic refraction—with full correction. Proceeding onward to develop vision in the squinting eye by occlusion, the stimulation of binocular single vision with the aid of prisms, and finally the eliciting of depth perception. Duke Elder points out that any result which does not include this last feature is an imperfect one. He also suggests, and with this I agree, that as soon as fusion has been established and the angle is of moderate or large degree, operation should be performed in order to shorten the course of treatment and make the development of fusional amplitude easier. The objection that this should not be done under general anesthesia and therefore not early should not keep one from performing a 4 or 5 mm. recession of the internal rectus in a convergence excess or a shortening of the external rectus if indicated. This can be planned and executed safely under general anesthesia. The approach to parallelism thus gained

will materially shorten the training period. I have not found that 2/200 or 6/200 is sufficient visual acuity for the act of fusion in my practice. On the other hand we consider 20/50 as the limit for satisfactory training of and permanent holding of useful fusion.

I wonder if Dr. Fisher has had more cooperative patients than I have had, or mothers with a little firmer will. An occluder attached to the lens or soap rubbed on the glass is, it seems to me, unsatisfactory. If we are going to develop vision in an amblyopic eye I believe the occluding must be absolute day and night, and can be accomplished only by a patch and adhesive tape. How long this goes on depends on the patient's improvement and the possible temporary diminution of vision in the covered eye. Our job is to get both eyes as equal as possible, however, therefore as soon as the alternating stage is reached this part of the program is finished.

I do not know much about the use of bifocals in the treatment of strabismus, but I cannot see more than a limited use for them, perhaps in the case of the older school child for convenience rather than treatment. If atropine alone has a tendency to affect parallelism, then usually the prescription for a full correction will do the same.

Dr. George Guibor, Chicago: I think that we should compliment a man of Dr. Fisher's experience for bringing up a subject which those who are surgically minded prefer to omit. I should like to review some facts and observations that have been made in two of the orthoptic clinics in Chicago, and to emphasize some of the points that Dr. Fisher has discussed.

When a squint appears it should be treated as soon as the diagnosis is made. It may appear in an infant as young as six months. In a recent ophthalmic board examination the question was asked, "Suppose a mother brought an infant to you whose right eye turned in for five minutes at irregular times." The answer given was, "Tell the mother not to worry." This, however, I believe is an incorrect answer. Whenever an eye turns in for five minutes there usually is present a convergent squint. It is therefore important to differentiate physiologic deviations from strabismus. The physiologic ocular movements are of a rotary type usually and are bilateral. Those of strabismus are monocular in 80 per cent. of the cases of squint and are convergent. In infants with squint who cannot be given glasses, one drop of one per cent. atropine in the straight eye once a month will lessen the squint in such patients.

As soon as possible determine the errors of refraction by retinoscopy while the eyes are under an atropine cycloplegia. The complete hypermetropia and hypermetropic astigmatism should be corrected. Bifocals are especially useful if the esotropia is greater for near fixation than for distance. An ultex segment "A" or a cement bifocal is used. The bifocal segment should extend up to the lower margin of the undilated pupil. This usually places the upper edge of the bifocal segment above the center of the lens. If such a convex lens is prescribed an accommodative spasm is sometimes produced. Atropine is used to overcome the accommodative spasm.

Thus atropine and bifocal lenses are used to overcome accommodative and convergent overaction. When a patient has a visual acuity of 20/40 with atropine and glasses and only 20/200 when the cycloplegia is not effective, atropine is used to overcome this type of accommodative spasm. Do not reduce the power of distant lenses. Atropine is also used in one eye to produce blurring of vision of the fixing eye in suppression and amblyopic cases. Atropine reduces the time of occlusion. In many cases one must occlude fewer eyes, and one obtains better results than when one occludes the fixing eye without atropinization of both eyes.

I would dislike to recess an internal rectus muscle five millimeters in a child especially before attempting some orthoptic procedures. I should like to show you photographs of patients who have been corrected by non-surgical treatment. I always hope to undercorrect the convergent squints by surgery and complete the correction with glasses, bifocals, atropine and fusion training when possible.

Dr. W. A. Fisher, Chicago (closing): Dr. Haseltine has been of great help to me in changing some of my fixed and erroneous ideas regarding the care of squinting children. I should have known that during the last twenty-five years many oculists who have been in contact with him would be using bifocal glasses, but I did not realize it until my paper was finished. It seems strange that someone did not rush into print with such an important point. Dr. Haseltine's discussion has stressed many points in the paper, especially in exhibiting the style of glasses employed by him at this time. (Figure 1 in the paper describes it better than words.) Dr. Haseltine also stressed a very important point—that bifocal glasses can often displace the continued use of atropine. He also stresses overcorrection, which should never occur.

Dr. Whitsell believes that some form of occlusion would be better than soaping the eye-glasses. Many workers who agree with him are quoted in the paper. I preferred other forms of occlusion until I found soaping the glass was quite practical. Dr. Haseltine's exhibited glasses will interest and make clear large, inverted bifocal glasses.

Dr. Guibor is very enthusiastic in his work; his opinions are of great value, and I do not know of a better orthoptic clinic than the one he operates at the Northwestern University in Chicago. Atropine often continued over long periods may appear to him as indispensable, but if larger inverted bifocals as exhibited by Dr. Haseltine will lessen the period of atropine that Dr. Guibor often uses for this purpose, it would appear to be a step forward in the care of cross-eyes. There should be no spasm of accommodation necessitating the prolonged use of atropine so ably stressed by Dr. Haseltine in his closing remarks. If an over-correction is avoided, continue atropinization would not be necessary for spasm of accommodation.

GYNECOLOGIC RADIUM THERAPY

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My assignment to this symposium is the use of radium in gynecology. Obviously, it is impossible to discuss even briefly the various gynecologic uses of radium in the time allowed. Twenty to twenty-five years ago, when the average physician in this audience was graduating from medical school, but little instruction relative to the use of radium was given. In the third edition of Crossen's[1] (Washington University) voluminous "Diagnosis and Treatment of Disease of Women" which was a popular school text at that time, the word "radium" did not even appear in the extensive index and was mentioned only twice in the text. In the chapter "Gynecologic Treatment" we note that "radium and Finsen light are used but little, if at all," and in the chapter "Malignant Diseases of the Uterus" we are informed that in the treatment of carcinoma of the cervix "the effect of radium treatment is practically nil." The above are the only references to radium in the entire text although under the palliative treatment of fibromyoma of the uterus it is stated that intrauterine applications "are dangerous and inefficient."

Little wonder so much ignorance exists today concerning the value of radium therapy in gynecology, when only two decades ago medical students were taught that radium treatment had no place in gynecology. The majority of physicians in active practice today received this instruction and the great pity of it all is many of them still believe what they were taught. It is more difficult to unlearn than it is to learn.

During the past ten or fifteen years the gynecologic uses of radium have been firmly established. The chief advocates of this addition to our therapeutic armamentarium have been the gynecologists themselves rather than the radiologists. The generally accepted present day gynecologic uses of radium are well stated in Kaplan's[2] (New York University) recently published (1937) text "Radiation Therapy." The conditions in which Kaplan advocates the use of radium, within certain limits, are:

Kraurosis vulvae
Angioma of vulva
Carcinoma of vulva
Carcinoma of urethra
Carcinoma of vagina
Carcinoma of uterine cervix
Carcinoma of uterine fundus
Chorionepithelioma
Adenomatoid endometritis
Endometrosis
Uterine fibroids
Functional hemorrhage — menorrhagia and metrorrhagia
Production of sterilization

Since time does not permit a discussion of the uses of radium in all these conditions, I shall confine my remarks to the two gynecologic conditions in which radium has the greatest field of usefulness, viz., non-malignant uterine hemorrhage and carcinoma of the uterus.

NON-MALIGNANT UTERINE HEMORRHAGE

The most common form of non-malignant uterine bleeding is the so-called "functional uterine hemorrhage" (also called idiopathic bleeding, hyperplasia of endometrium, metropathic hemorrhagica).

The intrauterine application of radium in this condition is comparatively simple, and the results, with proper dosage, are excellent. Radium has a dual action in these cases acting on both the uterus and the ovaries. Radium rays have a pronounced reaction on the uterine mucosa itself, destroying the cystic glandular structure. The action on the ovaries is well known. In sufficient dosage radium rays destroy or suppress all the ovarian hormones.

Radium is being used with increasing frequency to control functional hemorrhage in young women in those cases where hormonal therapy has failed. The advantages of using radium over x-rays are: 1. the method permits a diagnostic curettage when the treatment is given; 2. the dosage is easier to control because of the constant rate of irradiation given off by radium; 3. the radiation is placed in direct contact with the pathologic uterine mucosa and in close approximation to the ovaries; 4. there is no variable abdominal wall thickness to interfere with absorption of irradiation; 5. the entire treatment can usually be given with a single application.

Read before the Section of Radiology, at the ninety-eighth annual meeting of the Illinois State Medical Society, Springfield, May 17, 1938.

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The above factors are of special importance in the treatment of young women where it is of the utmost importance that only small doses of radiation be given so as not to permanently destroy the ovarian function. A number of competent gynecologists have shown that 200 to 500 milligram hours of intra-uterine gamma radiation is ideal in these cases. Keene[3] (Prof. of Clinical Gynecology, University of Pennsylvania School of Medicine) reported menstruation restored to normal (or nearly normal) in 88% of women treated with radium under thirty years of age while Neill[4] (Gynecologist at the Howard Kelley Clinic in Baltimore) did not fail to control the bleeding in a single case in young women. Dr. Neill[5] recently stated, following nearly two decades of experience, "I am still using this treatment most successfully. . . In the younger women I have also found it possible to reduce the amount of intrauterine radium treatment, giving no x-ray. My experience in these cases, with this type of therapy, has been all that could be desired."

In older women (over 35) the same advantages of radium over x-ray are apparent although both procedures unquestionably give excellent results. At this age, because of the possibility of overlooking an unsuspected malignancy, it is a good dictum to always perform a diagnostic curettage. Since this procedure affords the opportunity to insert radium at the same time, the two procedures can be done with a single hospitalization. The increased opportunity of accurately diagnosing the condition, which only curettage affords, and to give adequate radium treatment with a single trip to the operating table, appeals to many patients.

Our records show that during the fourteen year period of 1924 to 1937 we treated or supervised the treatment of 1,600 patients suffering from non-malignant hemorrhage. At the end of 1934 there were 830 in this group. At that time we succeeded in tracing 510 of these patients who had been treated one or more years previously and found there were 494 clinical cures (96.9%) and 16 unsatisfactory results. It is interesting to note that in this entire series of 510 traced cases, there were only 12 in which the bleeding was not controlled (2.4%).

CARCINOMA OF THE UTERINE CERVIX

Although the gynecologists of this country have practically abandoned surgery in the treatment of uterine cervical carcinoma we still find many general surgeons who are attempting some type of surgical procedure in this condition. Radiation treatment is depended upon entirely for this condition in practically all the large cancer clinics of the world. The so-called Stage 1 growth (where the lesion is strictly limited to the cervix and the uterus is freely movable) is a readily operable condition, but unfortunately it comprises only about 10% of cases when first seen. All are agreed when surgery is attempted, a radical abdominal panhysterectomy (Wertheim) is the procedure of choice. Unfortunately, this carries a high operative mortality, which is shocking in the hands of the surgeon who only occasionally follows this procedure. Weibel[6] in 1,000 cases, had a 13.8% operative mortality, to report the best. On the other hand, there is but little danger, in competent hands, in carrying out the radiation technic; Bowing,[7] with a mortality of only 1.1% in 981 cases, to report the best results. Furthermore, it is not shown that the end results, in the operable cases (Stage 1 and 2) are any better than those obtained by radiation therapy. Weibel,[6] to quote the most successful, had a 40% five year survival in 1,000 cases operated upon, while Regaud and Lacassagne had a 44.7% five year survival in 459 operable cases which were treated with radiation, although in their latest five year series this had risen to 55%.

Another great drawback to surgery, is that over 50% of the patients when first seen have advanced lesions (Stage 3 and 4) in which the surgical treatment cannot even be considered. Furthermore, it is recognized that no more radical surgical procedure than the Wertheim panhysterectomy can be attempted, hence the results of surgery are practically stationary. Radiation therapy, on the other hand, is yearly improving and no one knows what brilliant results the future holds. This is emphasized by the recent publication[8] of the latest five year statistics from The Radium Institute of the University of Paris, one of the leading cancer research centers of the world. The results obtained in the 1930 series are now available and reveal a five year salvage of 46.8% of ALL patients treated that year. *This is, without doubt, the highest percentage of five year cures ever reported for this disease,* considering the method of compiling the statistics, which are as follows:

ALL cases treated are recorded; the treatment was entirely radiological (no operative cases); all had microscopic proof of the disease; all were examined *five years after treatment was begun and found free from cancer;* all patients lost trace of or who died from intercurrent disease during this five year interval were considered cancer deaths as far as the statistical study was concerned.

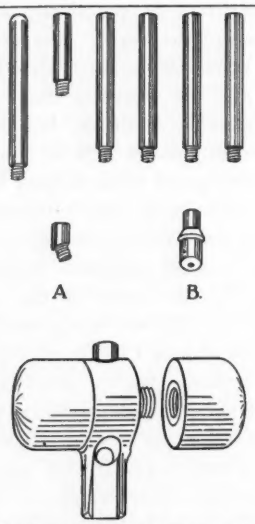

Fig. 1. Individual Parts of Author's Platinum-Silver Uterine Radium Applicator for treating uterine cancer. The applicator can be assembled to treat uterine canals of various lengths. A. Uterine angle wedge, 15°; B. Screw-cap end, threaded for introducing handle, for use without vaginal cross arm piece. (Actual size.)

In 1930, Regaud and Lacassagne at The Radium Institute of the University of Paris, treated exclusively with radiation therapy 111 patients with microscopically proven uterine cervical cancer, representing all stages of the disease. Five years later 52 of these patients were alive and free from cancer, representing a five year curability of 46.8%. (54 were dead from cancer, three were still alive but suffering from recurrent cancer and two had died of intercurrent disease.) Had these statistics been compiled on the basis more commonly used, that is: 1—patients dying from intercurrent disease not being considered cancer deaths; and 2—patients alive but suffering from recurrent cancer not considered as cancer deaths, there would have been a total of 55 alive of 109 treated (the two dying from intercurrent disease being eliminated from the study) or a five year salvage of 50.1%.

The radiation treatment consisted of heavily filtered radium from multiple centers distributed

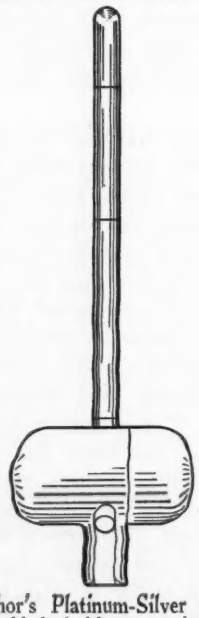

Fig. 2. Author's Platinum-Silver Uterine Radium Applicator assembled (without uterine angle wedge) for use in an average length uterus. The uterine stem is designated for the use of 1 Mm. platinum radium cells, is unusually slender (3.8 Mm.), necessitating a minimum cervical dilatation, and may be covered with one or more layers of ametal rubber.

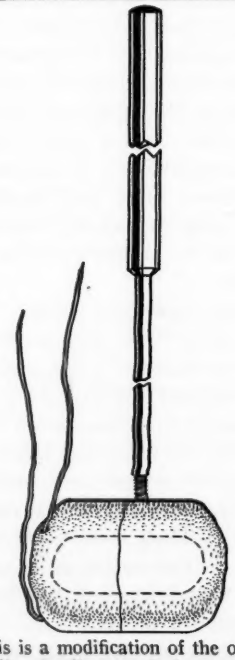

Fig. 3. This is a modification of the original London Vaginal Bakelite Applicator. It is 20x30 Mm. in size, encloses a heavily filtered radium capsule, and is introduced by means of a slender introducing handle into each lateral vaginal fornix. (Actual size.)

throughout the uterine canal and vaginal vault, slowly administered, with the addition of external high voltage x-ray therapy or teleradium therapy in all but the Stage 1 growths. In a typical case Regaud and Lacassagne[9] use 66.6 milligrams of radium, equally distributed between uterus and vagina, (six centers) for approximately 8,000 milligram hours of radiation in five to eight days, the essential filtration we have pursued. Over ten years experience in over 1,200 patients (176 in 1937) have summated in the adoption of the technic shown in the slides to follow.

All statistical studies emphasize the great value of external radiation in supplementing the internal intrautero-vaginal radium therapy in the treatment of uterine cancer. This is usually given by high voltage (200,000 volts)

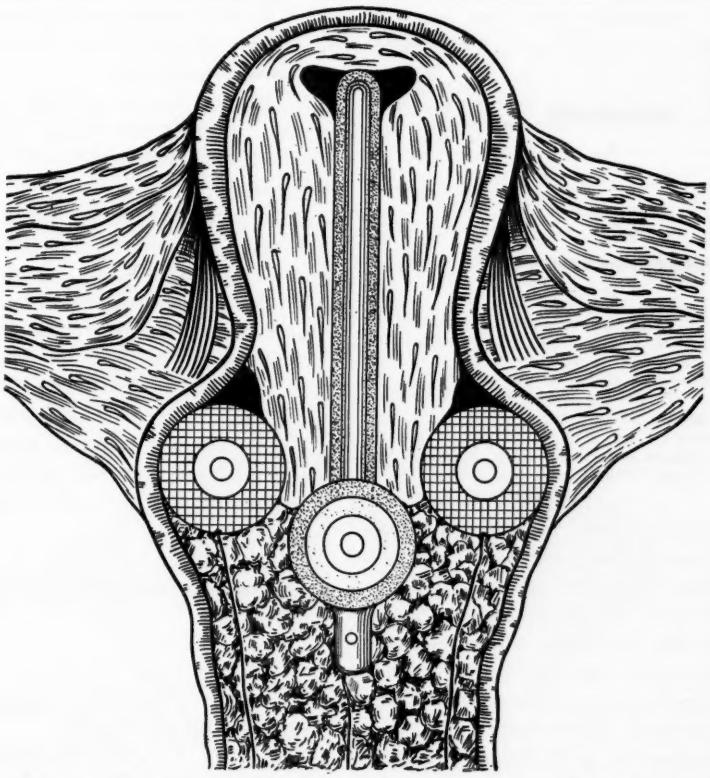

Fig. 4. Illustrating the Author's Platinum-Silver Uterine Radium Applicator (covered with ametal rubber), and two modified London Vaginal Bakelite Applicators in proper position for treating a typical case of uterine cervical cancer in accordance with the Paris (Regaud and Lacassagne) technic. (Actual size.)

being one millimeter of platinum in the uterus and 1.5 millimeters in the vaginal vault.

During the past decade (1928-1937 inclusive) I have treated or supervised the radium treatment of 1,176 patients suffering from uterine cancer. During this period most of these patients have been treated by a modification of the Paris (Regaud) technic mentioned above and we, too, have been enthusiastic with our results. Time will not allow a discussion of the number of modifications of the Paris technic x-rays, administered through multiple portals. Todd[10] states, "The general opinion is that x-radiation supplementing radium can improve the five year results from 5 to 10 per cent. Regaud's five year figures increased from 24% in 1927 to 33% in 1932 with the supplementary use of x-rays."

CARCINOMA OF THE UTERINE FUNDUS

Radiation therapy is being used with increasing frequency in the treatment of uterine body

cancer. The results of the surgical treatment compared with the radiological treatment are practically the same, if the same stage of the disease is considered. Recently, Arneson[11] analyzed the results of 998 radiologically treated patients and 927 surgically treated patients. The five year cures of the operable patients treated by irradiation alone, were 53%, the surgically treated patients 57%. He states that the results from hysterectomy alone have been slightly better than from irradiation alone, but the best results were obtained by irradiation followed by

Fig. 5. A. Old Style radium needle containing 10 milligrams, size 1.75x27.5 Mm. with wall thickness of 0.4 Mm. of non-corrosive steel (density 8.7); radium occupies only about one-third of the length of the needle—10 Mm. (Twice actual size.) B. New style radium cell containing 10 milligrams; size 1x20 Mm. with wall thickness of 0.2 Mm. of platinum (density 21.4); radium occupies nearly the entire length of the cell—18 Mm. (Twice actual size.)

hysterectomy; preoperative radiation is apparently more valuable than postoperative and is advocated especially in patients with undifferentiated tumors; the volume of tissue receiving a tumor lethal dose from intrauterine radium is not great and a given dose will be delivered to a greater volume if external irradiation is also employed; a course of high voltage x-rays, preferably administered by a divided dose technic, preceding intrauterine radium is recommended to reduce the danger of forcing viable cancer cells through the lumen of the tubes into the peritoneal cavity and to facilitate insertion of radium by causing regression in tumor size.

It is of utmost importance that every uterine body cancer have a microscopic study of the uterine scrapings as the surgical treatment of Grade IV growths is practically of no avail and these cases should receive irradiation alone. In the other grades, patients should be given the choice of surgery or irradiation if the patient is clinically and technically operable and preferably the combined procedures should be used. Patients with extension of the disease beyond the limits of the uterine myometrium should be considered inoperable. If irradiation is the choice, it is of the utmost importance that internal radium therapy be combined with adequate external irradiation, if the best results are to be obtained. If the patient is clinically or technically inoperable both internal radium and external irradiation should be used.

CONCLUSIONS

1. Radium therapy is a valuable addition to our armamentarium in the treatment of certain gynecologic conditions.
2. Radium has its greatest gynecologic use in the treatment of certain forms of benign uterine hemorrhage and in uterine cervical and body cancer.
3. Radium and x-rays are not competitors to surgery, all being useful methods which require intelligent selection for application.
4. All patients suffering from uterine cervical cancer should receive intensive intrauterovaginal radium therapy and if the growth is beyond Stage 1, the treatment should be supplemented with external irradiation.
5. All patients suffering from uterine body cancer preferably should receive combined internal radium and external irradiation in addition to a panhysterectomy (preferably also bilateral salpingo-oophorectomy) if the patient is clinically and technically operable. If irradiation is to be depended upon alone to control the disease, or if the growth is inoperable, both

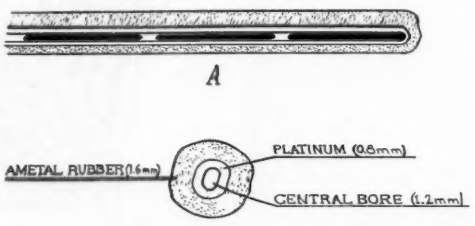

Fig. 6. A. How the new style radium cells appear when placed in the uterine stem of the author's new platinum applicator (shown covered with 1.6 Mm. of ametal rubber). Note that there is almost an interrupted source of radium along the entire length of the applicator assuring uniform radiation throughout the entire length of the uterine canal. (Actual size.) B. Cross section of uterine stem of author's new platinum applicator covered with ametal rubber. (Twice actual size.)

intensive internal radium and adequate external irradiation should be used.

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TABLE 1

UTERINE CERVICAL CANCER—1930 SERIES—5 YEAR RESULTS AT THE UNIVERSITY OF PARIS (REGAUD AND LACASSAGNE)

	Patients Treated	% Each Stage	Cured End 5 Yrs.	% 5 Yr. Cures
Stage 1*	16	14	12	75
Stage 2	34	31	19	55.9
Stage 3	47	42	16	34
Stage 4	14	13	5	35.7
Total	111	100%	52	Aver. 46.8%

*The stages of the disease are those outlined by the Radiological Subcommission of the League of Nations.

TABLE 2

RADIATION VERSUS SURGERY IN UTERINE CERVICAL CANCER

One hundred patients suffering from ALL stages of cervical cancer, seeking the best surgical or irradiation treatment should show the following end results:

Treat.	No. of Patients	Accepted for Treatment	Per Cent 5 Year Cures	Treatment Mortality	Alive End of 5 Years
Surgery	100	40	40% (Weibel) (Stages 1 & 2)	13.8%	16
Radiation	100	95	40% (Regaud) (Stages 1, 2, 3, 4)	1.6%	38

The results from radiation therapy are, therefore, nearly 150% better than from surgery. The radiation 5 year cures for Stage 1 and 2 growths were 55% at Regaud's clinic (compared to 40% for surgery by Weibel). For Stage 3 and 4 growths Regaud had a 26.5% salvage, with no hope from surgery for this inoperable group.

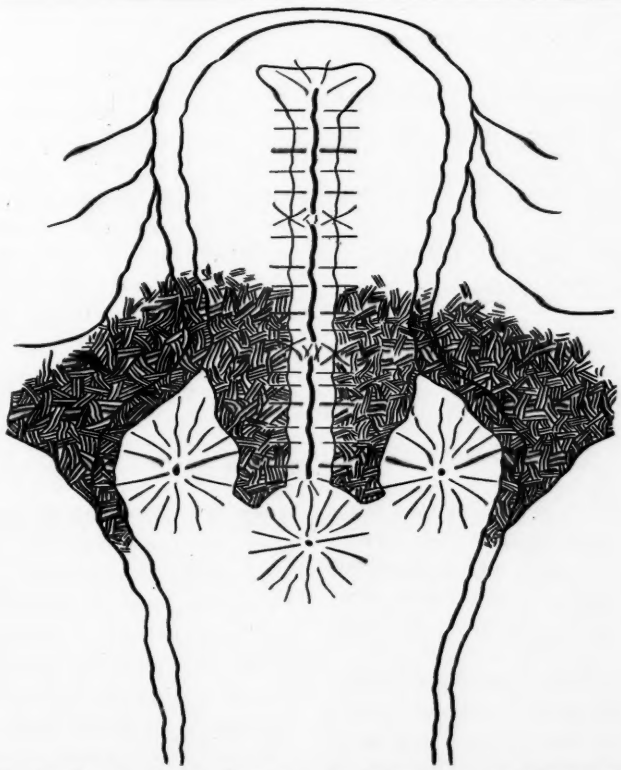

Fig. 7. A schematic drawing showing a Stage 3 uterine cervical carcinoma, the type most commonly present when the patient presents herself for treatment. The position of the radium cell centers, in accordance with the Paris technic, are shown in the uterine canal and vaginal vault, thus radiating the entire uterus, cross-firing on the cervix and sending radiation into the parametria. This technic is readily carried out with the author's uterine radium applicator with the addition of a vaginal colpostat or London vaginal bakelite applicators. (Actual size.)

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X-RAY THERAPY OF THE UTERUS AND ADNEXA.

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DECATUR, ILL.

Gynecologic neoplasms, especially when malignant, pose the question, "Surgery, radium, or x-ray therapy?" The problem is somewhat comparable to that of luetic therapy, "Mercury, arsenic, or bismuth?" The stage of the disease, the make-up of the host, physical and economic idiosyncracies, all bear upon the optimum answer. But basic principles deserve respect, hence this paper proposes to review some of these basic concepts.

Surgical extirpation, if complete and inclusive of all metastatic extension of malignant tissue, is unquestionably an ideal attack. But in actual practice cancer patients are rarely seen at a stage when such complete eradication by the scalpel is possible, even in the hands of a surgical master. Then too, radical operative procedures carry a large primary mortality, so it is small wonder that men like Doderlein, Kelly, Crossen, and Novak early gave their wholehearted support to radiation treatment of uterine cervix carcinoma, having found that results in all stages of this disease showed as high a cure rate from radiation as the best surgery could show in selected stage I and stage II cases. Such results were achieved principally with local radium applications, most commonly intra-cavitary (uterine and vaginal), occasionally by additional interstitial needles or seeds.

Fortunately for many patients, radium application fell within the capacity of the family doctor, so that many women received care that would otherwise have been denied to them, for only the most skillful surgeon could do a competent Wertheim operation. Unfortunately, mail-order prescribing has encouraged the empirical use of radium by many who have neglected to acquire some comprehension of the physical and biologic characteristics and limitations of this potent weapon. It is amazingly true that scores of general surgeons do not know what filtration they may be using, nor do they have even a suspicion as to what its influence is on effective dosage. Regardless, the patients are many who have been given added months of comfort and not a few have been cured, who otherwise could not or would not have sought more competent care in the tumor clinics.

But failures are far too frequent even among the cases receiving supposedly adequate radium therapy. We have all seen instances where the primary lesion has been completely controlled, the cervix rendered void of carcinoma cells even to the most careful search by serial section, yet the patient went on to die from metastases. Two of our cases emphasize this. Both showed complete eradication of the primary lesion by irradiation. One died of uremia from bilateral ureteral obstruction by carcinomatous lymphadenopathy just below the pelvic inlet. The other died of perforation of the iliac colon where left parametrial metastases had invaded it. There were no distant metastases. These tumors were radiosensitive as evidenced by complete control in the cervix, but the patients were lost because of pelvic extension. Radiation was adequate for the primary lesion, but the daughter cells outside the cervix were not controlled.

One important factor in this failure is to be found in the physical distribution of radiant energy, the intensity of which diminishes inversely as the square of the distance from the

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source. Because of limited supply radium has been used almost exclusively at close range. Thus, of the dose delivered at 1 cm. from the radium element, only one-fourth reaches to 2 cm., one-ninth to 3 cm. and one-sixteenth to the 4 cm. level. Therefore, a cancericidal dose throughout the cervix is accompanied by very much less than enough to damage tumor cells in the outer portions of the adnexa. Conversely, if a large enough dose were to be built up by intra-uterine radium to effect tumor cell destruction in the outer adnexa, the cervix and uterus would be almost completely destroyed with probable necrosis into both rectum and bladder.

Dosage distribution curves worked out by Arneson[1] visualize this very nicely. Figure 1 shows the distribution by iso-dose curves

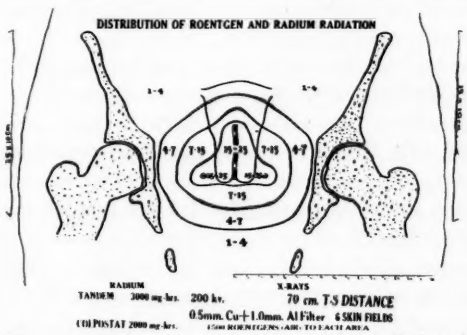

Fig. 1. Iso-dose curves for radium radiation in terms of T.E.D. (From Arneson.)

achieved with the Paris type of application, that is, an intra-uterine tandem with a colpostat laterally in the vaginal fornices. The numbers indicate threshold erythema doses* after the Memorial Hospital method of dosage designation. Healy, Arneson, and Stewart[2,3] found a minimum of six to eight such equivalent doses necessary to completely destroy the primary tumor. On this basis, only that portion of the parametria within about 3.5 cm. distance from the uterine canal receives an estimated cancericidal dose. In the adjacent zone, where four to seven T.E.D. are accumulated, there is no doubt appreciable damage to tumor cells. This means, however, that noteworthy effects are limited to within 5 cm. distance of the center of the uterus. Beyond this not much deterrent action can be anticipated. Applicators which place the vaginal radium below instead of lateral to the cervix show even less efficient parametrial dosage.

To improve dosage to the parametrium, let us investigate external irradiation methods which include teleradiumtherapy (by a large radium pack at 10 or 12.5 cm. distance) and roentgen irradiation. Since large units of radium are so few in number, whereas x-ray equipment of 200 kilovolt or greater capacity is becoming more and more common, we will consider only roentgen therapy factors.

X-ray dosage distribution within the average female pelvis has been studied quite thoroughly by Quimby and Arneson[4]. Variations of port size and number and the effects on depth dose of varying the tube-patient distance were analyzed. With the factors of 200 Kv.P. and filtration of 0.5 mm. Cu plus 2.0 mm. Al, the most efficient and uniform distribution was obtained at 70 cm. focal-skin distance with six ports, each 10x15 cm. two anterior, two posterior and two lateral. Through the anterior and posterior ports the beam was directed vertically into the adnexa and not angled toward the cervix. A space of 2 cm. between the midline margins appreciably reduced the dose delivered to bladder and rectum. Figure 2 shows Arneson's computations for 1500 "r" (air beam) per field for

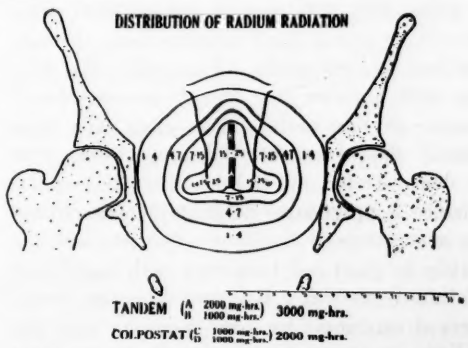

Fig. 2. Iso-dose curves in T.E.D. for Roentgen radiation with the factors indicated. (From Arneson.)

this six port technique expressed in terms of threshold erythema doses delivered within the pelvis. The figures on this chart are not large,

*The threshold erythema dose is approximately 525 roentgens (air) for 200 Kv.P. x-rays with 0.5 mm Cu filter for a 100 sq. cm. field. For radium, the T.E.D. is about 225 mg.-hr. for a tube 2 cm. long at a distance of one centimeter and with filter of 0.5 platinum.

but if we combine these radium and x-ray dosages, as shown in Figure 3, we find that area receiving cancericidal dosage of seven or more threshold erythema dose equivalents is extended

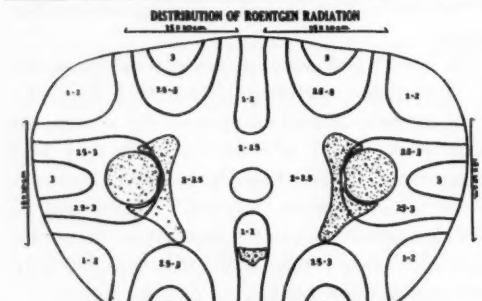

Fig. 3. Iso-dose curves in T.E.D. for combined radium and Roentgen radiation, with the factors indicated. (From Arneson.)

substantially farther into the parametria, and the zone in which definitely deterrent influence is exerted is carried outward to the pelvic wall. Thus on a purely physical basis, there is excellent evidence favoring roentgen radiation as a complementary modality with radium in treatment of carcinoma of the uterine cervix.

Biologically, another factor must be considered, distribution of dosage in respect to time. Radium is usually given in relatively low intensity, continuously over a period of three to five days. X-ray, under the influence of Coutard, is more often applied over comparatively long periods, by giving small fractions daily throughout four to eight weeks. Apparently, this practice adds a factor not directly measureable in simpler physical units. These small daily doses, frankly not of cancericidal proportions, seem, as demonstrated by Melnick and Bachem,[5] to produce a progressive deterioration of succeeding generations of daughter cells that leads ultimately to giant cell formation with inability to continued survival. Everyone who has treated cervical carcinoma by x-ray alone, or as a preradium measure, has repeatedly seen large, bleeding, fungating tumors melt down and the cervix returned almost to normal in the presence of doses that are certainly far less than the supposed cancericidal dose. On the basis of the Arneson and Quimby charts scarcely more than a fourth or fifth of the estimated necessary minimum dose could have been given. Even allowing for a wide range of radio-sensitivity within a single tumor, time distribution of dosage would seem to be a significant factor.

Incidentally in this connection, it is well to remember that pre-radium roentgentherapy frequently makes possible easier and more satisfactory placing of radium applicators. An upper vagina, narrowed and stiffened by cancerous or inflammatory changes, can be softened to permit better placement of the colpostat, and, more important, permit more effective packing away of the bladder and rectum from the radium sources.

For clinical confirmation of these theoretical considerations one might point out that Heyman[6] at the Radiumhemmet, where for years only radium was used in treatment of uterine cervix carcinoma, now is using supplemental roentgen therapy routinely in all cases. It is standard practice by Regaud and Lacassagne at the Radium Institute in Paris. Baclesse,[7] in Coutard's clinic, achieved a 36% five year survival rate for stage III solely by x-irradiation, using doses totalling 13,000 to 14,000 "r" over 35-50 days of treatment. To the best of my knowledge, all of the large tumor clinics in this country routinely use x-ray before and/or after radium application, and in many of the Stage III and IV cases rely solely on roentgen-therapy for palliation with not infrequent cures resulting.

These concepts are not new, but the practicing radiologist is almost daily re-amazed by the general medical and lay ignorance of or indifference to the advantages of combined radiation techniques. It needs to be repeatedly emphasized that x-ray and radium radiations are the same kind of energy, with closely comparable biologic effects, and differing principally in the space distribution of their zone of influence. Radium operates intensively in a small area close to the applicator, and the effects decrease very rapidly as the distance from the source is increased. X-ray provides tremendous amounts of a similar energy, which can be used at substantial distances from the source to obtain more uniform dosage through larger bodies of tissue. True enough, radium, in a small fraction of its radiant energy, produces rays of much greater penetrability than can be obtained with the hardest

rays of our largest x-ray equipments. But radium furnishes its energy at a fixed low rate so that all of the refined radium in the world, if gathered in one bomb, would still provide no such magnificent volume of radiant energy as does almost any of our modern x-ray generators. So, for practical purposes, let us think of radium as the small source of radiant energy for local application with efficient results limited to a narrow zone, and of x-ray as a large volume agent for more uniform effects through large masses. Perhaps we can apply this concept to some of the other problems of gynecology.

Carcinoma of the uterine fundus is generally slower to metastasize than that of the cervix. Thus surgery, by removing the tumor bearing tissue with hysterectomy, has achieved enviable results. However in the early case that is a poor operative risk, intra-uterine radium frequently effects control of the disease because all the tumor cells lie close to the applicator. But in the more advanced case, with tumor cells escaping to the parametrium, supplemental roentgen irradiation can extend the zone of control, and may mark the difference between success and failure. In the borderline operable case can any gynecologist by any of our present methods of examination be sure that early metastases are not already taking place? Pre- or postoperative x-irradiation should help control many of these cells which the scalpel cannot reach. Heyman[8] has reported that of 63 such patients postoperatively irradiated, 50 were alive and symptom-free five years after treatment. Compare this rate of 79.4% with 55.3% cures in clinically operable cases, and with 41% in technically operable cases which were treated with radium only, all cases in the same author's hands. Healy[9] believes from his experience and observation at Memorial Hospital, "that adequate radiation therapy alone in the less favorable cases or preliminary to panhysterectomy in the surgically operable cases always should be the routine procedure." Here again, x-ray furnishes our weapon of attack upon the more diffuse parametrial zone; surgery and radium the weapons for the uterus.

Applying our x-ray-radium distribution pattern to the problems of so-called benign uterine hemorrhage is more apt to reverse the emphasis with radium the favored modality. Let us assume that curettage has been done so that we can be reasonably certain malignancy is not present. Benign endometrial disease can be considerably benefited by radium applications. Yet because radium exerts its principal effect close to the source even so sensitive a tissue as the ovary need not be damaged. Doses of not over 600 mgm-hrs (filtered with 0.5 mm platinum or equivalent) will frequently control hemorrhage without permanently depriving the woman below 35 of her ovarian function. External irradiation can scarcely influence an intra-uterine disease before considerable damage to ovaries has resulted. Hence in the benign conditions x-radiation should be the method of last resort only. Premature menopause is never to be undertaken lightly.

It follows, similarly, that in younger women fibroids should be a surgical problem as only by this method can the ovaries be preserved. Mechanical discomfort, rapid growth, toxemia due to necrosis, and in older women the need to rule out carcinoma, all argue for surgery. Only when the patient with fibroid is not operable can radiation be properly considered. Then application of our space distribution yardstick says x-ray. Only the submucous fibroid and the small intramural ones will receive enough radiation from an intra-uterine radium source to justify its use. For the most of fibroid tumors roentgentherapy through two or four ports makes for a more appropriate energy distribution to the tumor and its bed.

While we are discussing gynecologic problems there is one condition, which, though rare, has recently been showing such excellent results from roentgen treatment as to deserve mention in passing. That condition is tuberculosis of the female genital tract. Lenz and Corscaden[10] report some of their results with the conclusion that x-ray therapy in small doses is superior to surgery in cases of tuberculosis chiefly localized to the pelvis, where there is no ascites and little or no tendency to breaking down. It is useful as a postoperative measure in cases with ascites. Heyman has stated[6] that "x-ray can save many of the postoperative cases with fistulae who usually die. If confined to the abdomen or pelvis, one gets spectacular results." He emphasizes the importance of small doses, with plenty of time for any reactions to be allowed to subside. These are encouraging reports.

To summarize our main thesis, roentgen therapy on grounds theoretical and by clinical dem-

onstration deserves a larger place in the cognizance of the practicing clinician. The scalpel, radium, and x-ray are all in a way forms of surgery. The scalpel locally excises diseased tissues but must sacrifice a variable margin of normal with it. Radium locally and often with microscopic selection destroys diseased tissue with minimal damage to the normal. Roentgen irradiation gives a widespread attack on diseased tissues beyond the reach of either scalpel or radium, while maintaining microscopic delineation by its greater effects on neoplastic as compared with normal tissue. Awareness of these essential differences makes for better selection of the program which will offer the greatest likelihood of success in any given case.

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DISCUSSION

Roswell T. Pettit (Ottawa, Ill.): I would like to criticize the statistics as presented by Dr. Swanberg. With 265 doctors and only fifty-four per cent. reporting, I would not say those statistics were worth very much. I would criticize these statistics because of their incompleteness and also because these reports made from these physicians were not controlled.

Dr. W. I. Lewis, Herrin, Ill.: I should like to ask Dr. Swanberg regarding the usual dose of radium given in cervical carcinoma. Is it usually around seven to eight thousand milligram hours exposure? What is the lethal dose for each square centimeter of cancerous tissue? Has that been determined? Is it your experience that the most successfully treated cases are those treated heavily with the first dose and not to depend upon any subsequent radiation treatment?

Dr. Swanberg (closing the discussion): In regard to the criticism of the statistical data for non-malignant bleeding cases I want you to know that I merely put this slide in incidentally. Since we were only able to secure the cooperation of fifty-four per cent. of the physicians who controlled these patients we naturally can only report what fifty-four per cent. told us and it was these results that were tabulated on the slide.

As to the most effective radium dosage per square centimeter in the treatment of uterine cancer I cannot definitely state. I believe, however, that it has been proved that it is necessary to give seven erythema doses of radiation to successfully destroy squamous cell cancer. In treating a Stage 3 cervical cancer, which is the most common type, Regaud and his coworkers have found that it requires 8,000 milligram hours of irradiation distributed in accordance with their methods to successfully control the disease.

There has been considerable discussion as to what actually constitutes the Paris technic of radium therapy. In order to settle this matter I briefly wrote up a description of the technic as I thought it to be and sent it to Dr. A. Lacassagne of The Radium Institute of the University of Paris, for his criticism and suggestions. This was returned to me with a few corrections and I am, therefore, distributing at this meeting Dr. Lacassagne's "OKED" description of the method. You will note that at The Radium Institute of Paris they only use a total of thirty-three and one-third (33⅓) milligrams of radium in the uterus and the same amount in the vagina and that they have made no change in the amount of radium used for many years. The only changes in the radium technic that have been made within recent years is the fact that they no longer use aluminum covering for their applicators, and have increased the size of the vaginal applicators in order to give a better depth dose. Formerly the vaginal applicators were fifteen millimeters in diameter and now they are using them twenty millimeters in diameter. The primary filtration in the uterus and vagina are the same as that used heretofore, that is, one millimeter of platinum in the uterus and one and one-half millimeters in the vagina.

The Marie Curie Hospital in London, where they used radium exclusively for cervical cancer for a number of years, published some excellent statistics showing thirty-three to forty per cent., five-year survivals. Within recent years they have added high voltage x-ray therapy to their radium technic and it will be interesting to note in a few years' time what percentage of cures they are reporting.

As you know Regaud uses both radium and x-ray in all cases except in the so-called Stage 1 growth where radium is used exclusively. The x-ray technic that Regaud follows, however, is difficult to duplicate in this country, because he insists that the x-rays be administered slowly, giving the patient from one to two hours treatments each day for four to six weeks. The radium treatment is also administered slowly requiring from five to eight days to administer the 8,000 milligram hour dosage.

There is no question that the life of the patient greatly depends upon the intensity of the first radium treatment and if this dosage is adequate and the tumor sensitive no further radium treatment is necessary in most cases. Another procedure that has been changed in recent years in Paris is the fact that they no longer give the whole x-ray cycle before the radium treatment is administered. The plan now is to give one-half of the cycle before the radium treatment is administered and then give the other half after the radium treatment has been completed. It has been found that if the entire cycle is administered before the radium treatment is administered there is fre-

quently such a marked shrinkage of the vaginal vault that applicators cannot be satisfactorily placed. They now feel in Paris that two or three weeks after the institution of the x-ray treatment is the optimum time to use the radium and in this interval the patient also receives daily vaginal douches.

Dr. Halley (closing the discussion): The question of pain brings up a subject that is more or less a chronic irritant to the radiologist and is going to be a larger irritant as our doses climb in our efforts to find the top limit of safe radiation, namely, late skin changes. You can usually get the referring physician to aid you in controlling the patient during the early skin reaction, but when the late changes come about, the patient comes in and says, "Dr. ——— says you burned me." Yes, the patient was burned, but it is a sound procedure and certainly it is justified if the mutilation by radical amputation of the breast is justified. It seems to me that many of these patients who live to regret skin changes are just that fortunate because they probably would not be here without them. I think it is a subject which is going to receive a great deal more attention with larger doses. You see appearing in the literature a moderate number of cases of damage to the bowel, but in the series they come from, they constitute a surprisingly small per cent.

I think much help can be given the radiologist in the attack on the cancer problem by a little more open-minded cooperation from the general practitioner who has to live with these patients. I know it is a trial but certainly the results make it worth while in many cases.

STUDIES ON MERCURIAL DIURESIS

Esidrone, A New Mercurial Diuretic

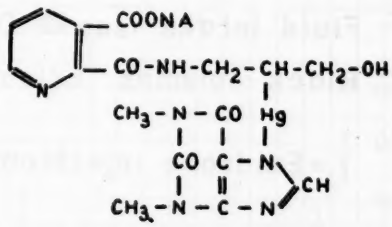
ITALO F. VOLINI, M. D. AND
ROBERT O. LEVITT, M. D., CHICAGO

A. Introduction. While diuretic drugs should be considered only as adjuvants to other methods of treatment of edema, the frequent failure of digitalis and rest in the therapy of congestive heart failure renders the organic mercurials the most important agents in the physician's armamentarium.

The effectiveness in producing rapid improvement of the patient, together with the disappearance of the necessity for the use of skin punctures and Southey's tubes, and even a decrease in the frequency of recourse to paracentesis, mark the introduction of mercurial diuretics as the most important advance in cardiac therapy since the discovery of digitalis. Although these drugs are usually employed in the advanced stages of heart failure when dropsy is pronounced, they are of considerable benefit to patients who have minimal or even indetectable edema.[1] Vital capacity is often increased immediately following their administration, as shown by Alsever and Levine.[2]

Since Saxl and Heilig[3] in 1920 described the excellent diuretic effect of the organic mercurial compound merbaphen, several somewhat similar drugs have been introduced in the last fifteen years. We are reporting the clinical use of a new compound, esidrone.

B. Chemical Description of Esidrone. This new compound is described as the sodium salt of pyridinedi - carboxy - B - mercuri(o)hydroxypropylamide-theopylline with the following structural formula.



It is a stable, neutral, crystalline substance which is readily soluble in water. It contains 31.2% mercury in non-ionizable form and 28% theophylline which is chemically connected with the mercury molecule.

C. Pharmacological Properties. These have been reported by Hartman and Panizzon[4] and Uhlmann.[5] Esidrone has a marked diuretic action in the rabbit and the dog. While several investigators[6] working with salyrgan report hemoconcentration as the effect on the blood, in both the initial and later stages of the diuresis, the pharmacological evidence with esidrone indicates the development of a pronounced hydremia as the initial effect during the latent period before the increase in urinary excretion. Later, hemoconcentration is demonstrable as the urinary output begins. A marked chloride elimination occurs with the diuresis including sodium and the other constituents of the urine. The mercury fraction of this compound is rapidly eliminated, 91% appearing in the urine eight hours after injection, probably thus accounting for the infrequency of toxic effects. The minimum lethal dose of the drug in rabbits is 0.2 gm/kg when injected subcutaneously and 0.025

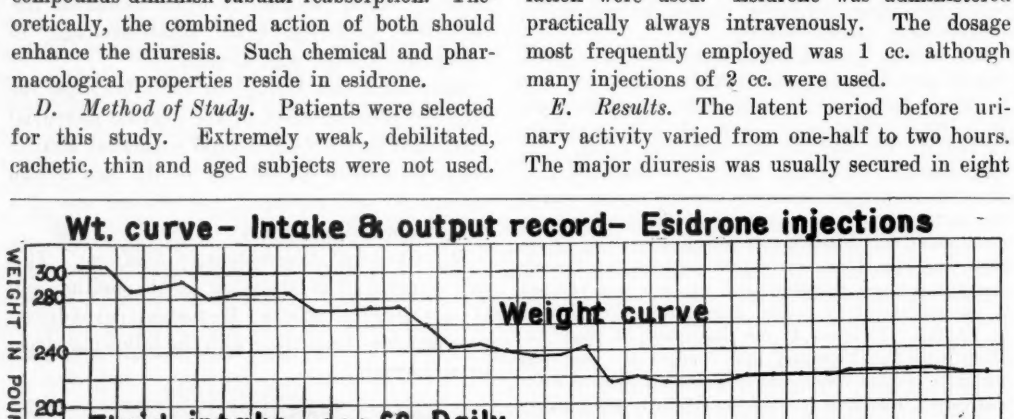
From Cook County Hospital, Chicago, and the Department of Medicine, Loyola University School of Medicine.

This investigation was aided by a grant from the Ciba Pharmaceutical Products, Inc.

mg/kg intravenously. As shown by Herrman and Deebled,[7] the zanthine derivatives probably increase glomerular filtration and mercurial compounds diminish tubular reabsorption. Theoretically, the combined action of both should enhance the diuresis. Such chemical and pharmacological properties reside in esidrone.

D. Method of Study. Patients were selected for this study. Extremely weak, debilitated, cachetic, thin and aged subjects were not used. Those who showed severe kidney damage were discarded. All were on our cardiac regime, bed rest with a diet consisting of 1683 calories, carbohydrate 215 gms., protein 55 gms., fat 67 gms., NaCL 0.985 gms. with total twenty-four hour fluid intake of 1600 cc., this including the calculated water content of the foods. Potassium chloride was given at meals. Digitalis and ammonium chloride were used on most patients with morphine and phenobarbital for sedation. A base line of urinary excretion of three days was generally sought before esidrone was employed except where such delay would result in too great a danger for the patient. Daily weight records with twenty-four urinary output calculation were used. Esidrone was administered practically always intravenously. The dosage most frequently employed was 1 cc. although many injections of 2 cc. were used.

E. Results. The latent period before urinary activity varied from one-half to two hours. The major diuresis was usually secured in eight or nine hours, so when the administration was in the morning the patients were not disturbed the same evening or night. Carry over activity was noticeable to the third day following administration. Chart No. 1 indicates this effect. The total number of patients used in this study was 35 who were given 125 injections. The maximum number of injections to one subject was 17, another 14. Several patients received only one dose. The etiologic heart disease represented comprised hypertensive and arteriosclerotic, rheumatic, luetic, chronic cor pulmonale,



thyrotoxic. Five patients with alcoholic cirrhosis and ascites are not included in the above series of 35. The following tabulations summarized the diuretic response in five patients.

CHART 1.

Total number of patients—35.
Total number of injections—125.
Maximum number of injections to one patient—17.
Minimum number of injections to one patient—one.
Average diuresis for one injection—3450 cc. (This includes both the 1 cc. and 2 cc. dosages.)
Maximum diuresis from one injection in 24 hours—8300 cc.
Minimum diuresis from one injection in 24 hours—1000 cc.
Maximum weight loss from diuresis—119 pounds in 66 days.
Percentage increase of urinary output induced by esidrone:

Injection	Per. Inc. 1st day	Per. Inc. 2nd day	Per. Inc. 3rd day	Per. Inc. Total 3 days
Wm. S. First Series—				
1	1000	450	343	1793
2	80	50	25	155
3	600	400	60	5060
4	650	216	166	1032
5	300	0	25	325
6	220	70	..	290
7	160	75	40	275
8	700	428	200	1328
9	300	150	No Inc.	450
W. S. Second Series—				
10	650	238	112	1000
11	350	109	90	549
12	330	120	70	520
13	500	270	77	847
14	860	600	180	1640
J. S.				
15	350	156	124	630
A. F.				
16	1080	800	180	2060
17	500	200	84	784
18	225	166	77	468
19	490	390	200	1080
20	700	450	250	1400
21	180	100	50	330
22	270	250	114	634
23	1000	500	166	1666
24	180	145	100	425
25	428	314	284	1026
26	380	300	150	830
A. O.				
27	1200	140	70	1410
28	570	100	100	770
T. G.				
29	500	333	133	966
30	200	150	50	400
A. S.				
31	1100	500	300	1900
32	550	275	125	950

The records of these five patients are illustrative of the activity of esidrone. These are given very briefly, only the essential pertinent facts, findings and laboratory data being furnished.

1. A. F., white male, 55 years of age, railroad switchman, admitted to Ward 63 on 4/16/38, with a complaint of severe shortness of breath and generalized swelling. The history dated back two years with gradual progression and no response to digitalis and other standard treatment. The weight increase amounted to over 100 pounds. The patient was in severe congestive heart failure with generalized anasarca, with enlargement of the heart to the left and distant muffied heart sounds. The diagnosis was hypertensive and arteriosclerotic heart disease. His weight was 305 pounds. The pertinent laboratory evidence was urine 3 plus albumin, Kahn 1 plus, blood urea 23 mg. per cent CO_2 combining power 50 vol. per cent. The EKG showed left axis deviation with low voltage. Venous pressure 320 mm. He was placed on the cardiac regime without ammonium chloride but no digitalis was given. The urinary output varied from 500 to 1,000 cc. On:

4/19/38 Esidrone 2 cc. output 5300 cc.
4/22/38 Esidrone 2 cc. output 4000 cc.
4/25/38 Esidrone 2 cc. output 4000 cc.
4/26/38 Ammonium chloride 2 grams t.i.d. started.
4/29/38 Esidrone 2 cc. ouput 5300 cc.
4/30/38 Paracentisis abdominis; only 700 cc. obtained.
5/6/38 Esidrone 2 cc. output 8300 cc.

Patient complained of dysuria and frequent bowel movements. Red blood cells found in the urine.

5/7 Ammonium chloride discontinued.
5/6 Urine clear—No symptoms of dysuria or diarrhea. Esidrone 1 cc. output 1800 cc.
5/18 Diuretin gr. LX. No change in output.
5/20 Esidrone 2 cc. ouput 1900 cc.
5/27 Esidrone 2 cc. output 3500 cc.
5/28 Paracentesis abdominis 2500 cc.
5/31 Esidrone 2 cc. output 3000 cc.
6/4 Esidrone 2 cc. output 2000 cc.
6/7 Mercupurin 2 cc. output 2000 cc.
6/8 Ammonium chloride 2 grams q.i.d.
6/11 Esidrone 2 cc. output 3000 cc.
6/15 Esidrone 2 cc. output 5700 cc.
6/20 Esidrone 2 cc. ouput 6000 cc.
6/22 Weight 186 lbs.—a loss of 119 lbs.

2. A. O., white female, 60 years of age was admitted on 2/1/38 with complaints of orthopnea and severe edema of several months' duration, with a history of extreme nervousness for many years, aggravated by psychic shocks. The essential physical evidence was the startled facial expression due to proptosis, all the signs of thyrotoxicosis with a large right thyroid lobe and severe general anasarca. The heart border extended to the left anterior axillary line and there was auricular fibrillation corroborated by the electrocardiogram. The B.M.R. was 60 plus. The diagnosis was thyrotoxic heart disease.

On 2/5/38 she was given 0.5 mgm. strophanthin intravenously daily.

2/11 Salyrgan intravenously 2 cc. output 1500 cc.
2/15 Esidrone 1 cc| intravenously output 6000 cc.
2/21 Esidrone 1 cc. intravenously output 4000 cc.
2/24 Salyrgan 2 cc. intravenously output 2000 cc.

Later a thyroidectomy was performed but the auricular fibrillation persisted, although congestive failure did not return.

3. J. S., male, Chinese, 51 years of ago admitted on 5/11/38 with severe congestive heart failure with pronounced epigastric pain. He had been admitted three times previously for somewhat similar complaints always with a history of severe cough of many years' duration. The cyanosis was extreme with severe general anasarca and dyspnea. The examination revealed the loud systolic murmur of tricuspid insufficiency with a very large, tender, pulsating liver. The venous pressure was 330 mm. The red count was 8,020,000 and Hg, 108 per cent. The EKG showed marked right axis deviation. The diagnosis was chronic corpulmonale due to chronic bronchitis and emphysema, severe congestive heart failure of the right ventricular form with compensatory polycythemia.

The cardiac regime was instituted with digitalis and ammonium chloride. No improvement noted. 5/16/38 esidrone 1 cc. with output 4,500 cc He rapidly improved without further therapy and was discharged 6/18/38 edema free, still coughing with a weight loss of 29 pounds.

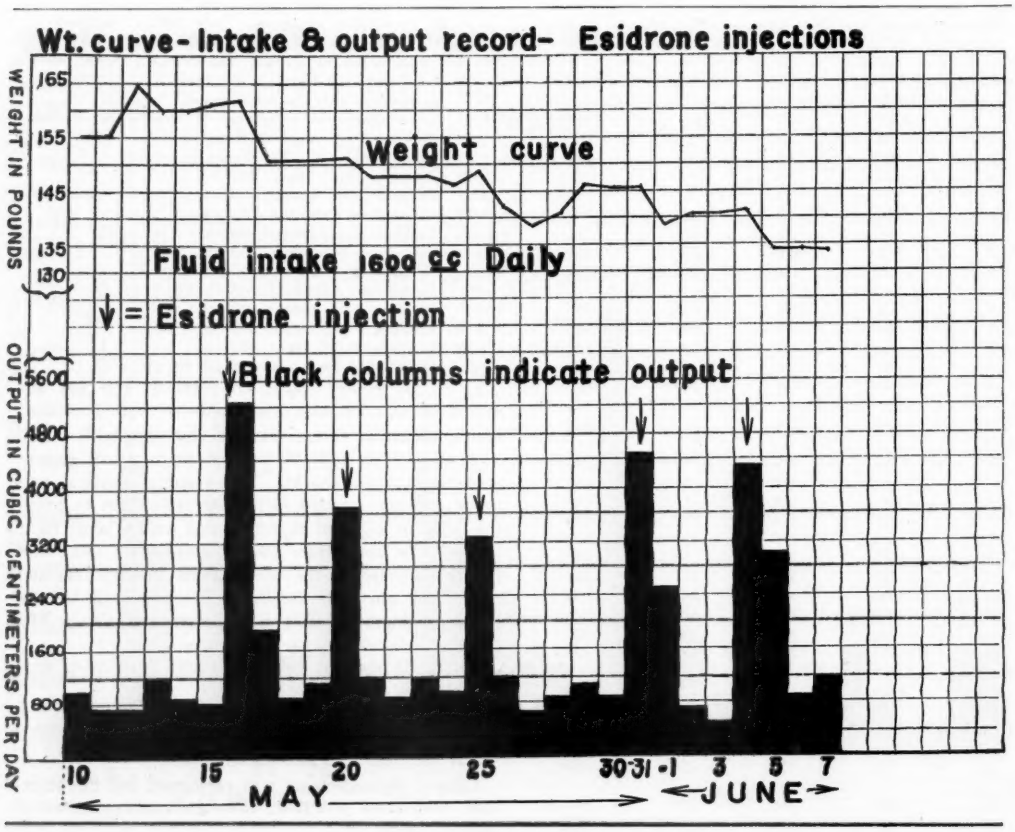
4. W. S., white male age 45 years admitted 2/6/38 with severe congestive heart failure and general anasarca. This was his fifth admission for somewhat similar complaints but of less severe degree. The diagnosis was rheumatic heart disease, mitral stenosis and regurgitation, auricular fibrillation and congestive heart failure, all indicated by the classical signs. The EKG showed auricular fibrillation with right axis deviation. The cardiac regime with digitalis and ammonium chloride was started.

2/9 Esidrone 1 cc. output 2500 cc.
2/11 Esidrone 1 cc. output 1600 cc.
2/15 Esidrone 1 cc. output 3000 cc.
2/19 Esidrone 1 cc. output 3900 cc.
2/23 Esidrone 1 cc. output 3000 cc.
2/28 Esidrone 1 cc. output 2900 cc.
3/5 Esidrone 1 cc. output 2800 cc.
3/9 Esidrone 2 cc. output 5600 cc.
3/14 Esidrone 2 cc. output 5000 cc.
3/18 Esidrone 2 cc. output 4400 cc.
3/22 Esidrone 2 cc. output 3500 cc.

He was discharged 3/25/38 compensated but with the auricular fibrillation with a rate at the heart of 70 per minute. On 5/7/38 he returned again with severe general anasarca more pronounced than the last admission. He did not respond to the cardiac regime including digitalis, so dehydration therapy was started nine days later.

5/16 Esidrone 1 cc. output 5300 cc.
5/20 Esidrone 1 cc. output 3800 cc.
5/25 Esidrone 1 cc. output 3300 cc.
5/31 Esidrone 2 cc. output 4500 cc.
6?4 Esidrone 2 cc. output 4300 cc.

He was discharged 6/20/38 compensated, still fibrillating, weighing 44 pounds less than an admission.



5. T. G., colored male, aged 59 years, was admitted 1/25/38 with substernal pressure, and severe congestive heart failure with general anasarca, This was his third admission to the hospital. There was a definite leutic history with no treatment. Physical and laboratory examination made the diagnosis of luetic aortitis, aortic regurgitation and general anasarca. The cardiac regime included digitalis.

1/27 Esidrone 1 cc. output 6000 cc.
1/30 Esidrone 1 cc. output 4000 cc.

The edema cleared rapidly, congestive failure disappeared and he was referred to the outpatient cardiac clinic on 2/5/38,

TOXIC, UNTOWARD AND LOCAL REACTIONS:

Reactions were not encountered in our series. The careful selection of patients probably accounted in some degree for this rarity. A few perivascular injections produced some pain and induration but no sloughing resulted. No cases of uremia as described by Hines[7] followed the use of esidrone as shown by frequent blood chemistry determinations. We have not met the dehydration syndrome described by Pohl and Stern[8] in spite of the profuse diuresis reported in many patients. Vein thrombosis did not occur with esidrone while experiences with other mercurials shows thrombosis noticeably frequent. Diarrhea was a symptom in one patient. After few injections, red blood cells were found in the urine of the individual, but we considered them to be of vesical and not renal origin, due to the great bladder activity and the absence of other evidence of renal disease. This dysuria disappeared in four days and further injections of esidrone produced no red blood cells.

COMMENT:

The etiologic type of heart disease with congestive heart failure does not influence the effectiveness of esidrone. While maximum diuresis in minimum time is not especially sought because of the attendant danger of the appearance of the dehydration syndrome, the measure of the effectiveness of the diuretic is determined in this way. Our series showed many instances of profound response without the dehydration syndrome. The heart action is unquestionably improved by the increased diuresis. This is accomplished by decreasing the load on the heart and secondly by increasing its ability to carry the load. Subjective improvement and the improvement and relief of symptoms corroborate the benefits to the heart by the removal of fluid. We will publish later, studies on the objective evidence of cardiac improvement by mercurial diuresis.

SUMMARY:

Esidrone is a very effective mercurial diuretic. It is non-toxic in therapeutic dosage under proper indications. The precautions ordinarily observed in the administration of mercurial diuretics should be employed. Local sloughing due to perivascular subcutaneous injection has not resulted.

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NON-MYXEDEMATOUS HYPOTHYROIDISM, CASE REPORTED WITH PSYCHOSIS

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Discussions of hypothyroidism play a limited role in the medical literature as compared to the hyperfunctions of this endocrine gland. Hypothyroidism is much more common than supposed—existing as a primary and as a secondary condition. Many of the easily fatigued, tired, apathetic, sluggish individuals with a dry skin and coarse hair, complaining of headaches, constipation, nervousness, and vague, non-localizing pains with findings of a low basal metabolic rate are cases of hypofunction of the thyroid. They are frequently overlooked and called neurotics

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by the practitioner or by a more pretentious term by the psychiatrist. Symptomatology may be limited to a few classical symptoms of hypothyroidism with the diagnosis suggested by laboratory findings of a low metabolism.

The terminology or classification of thyroid deficiencies in literature includes mild, severe, early, latent, masked, myxedematous, without myxedema, non-myxedematous hypothyroidism and hypofunctioning thyroid. A workable classification of adult thyroid deficiencies is (a) hypothyroidism, without myxedema; (b) myxedematous hypothyroidism; and (c) non-myxedematous hypothyroidism. Group (a), hypothyroidism, without myxedema, should include the mild or early cases of thyroid deficiency, without evidence of myxedema and a basal metabolic rate of —11% to —29%. Engelbach[1] states that it is questionable whether the slight hypometabolisms, that is, the range between —11% and —20% are of thyroid origin. These slight reductions of rates are more frequently due to hypofunctioning ovaries, pituitary and adrenals. Group (b), the myxedematous hypothyroidism, includes the severe cases of hypothyroidism with evidence of myxedema and a very low basal metabolic rate, usually —30% or lower. Group (c), non-myxedematous hypothyroidism, includes severe cases of thyroid deficiency with basal metabolic rate below —30%, absence of classical signs of myxedema and with less severe non-endocrine reaction. According to Engelbach the basal metabolic rate should be less than —30% before myxedema is considered as an entity. The term "non-myxedematous hypothyroidism" should, also, be restricted to the severe thyroid deficiencies with a basal metabolic rate below —30% inasmuch as myxedema usually does not present itself to any degree before this basal metabolic rate is reached.

The authors wish to report a case of non-myxedematous hypothyroidism in a thin, apathetic male with a basal metabolic rate of —45%, who, under thyroid therapy, gained 67 pounds and improved mentally.

CASE REPORT

Mental History: O. A. R., a single, 23-year-old white male adult, with negative familial history for nervous and mental diseases, was committed to the Elgin State Hospital in June, 1935. He had been in good health until 1932, his second year of college, when he became nervous, worried, restless, agitated, and unable to concentrate on his collegiate work. He was sent to a private sanitarium in June, 1932, and was diagnosed a case of schizophrenia. He improved after four months and was discharged, although he was still somewhat clouded and distractible. He adjusted fairly well at home, and was able to aid his father with his work.

In the fall of 1934 he again lost interest in his work, preferred to remain in bed, developed mannerisms, grimaces, rambling speech, and restlessness, necessitating a second admission to a private sanitarium in December, 1934. He was diagnosed a case of catatonic dementia praecox.

Patient was transferred from the private sanitarium to the Elgin State Hospital in June, 1935, where examination revealed a thin, indifferent, listless, white male who refused to eat and frequently required tube-feeding. He appeared retarded and indecisive, responding slowly to questioning after considerable stimulation and expressed vague paranoid ideas. He was diagnosed a case of dementia praecox.

Physical Findings: Because of the marked emaciation, patient was referred to the hospital service of the institution in October, 1935, for further examination and treatment. He was five feet, eleven inches in height and weighed 104 pounds. Daily temperatures varied between 97 and 98.2 degrees, rarely going above this latter reading. Pulse varied between 56 and 76, although it occasionally dropped to 48 in the early morning. The hair was not coarse, but there was some frontal thinning; thyroid was not palpable; heart negative except for bradycardia and a blood pressure of 84/64; abdomen thin; extremities, reflexes normal, some cyanosis of feet and nails; skin dry with some scaliness. Essential physical findings consisted of emaciation, dry, scaly skin, hypotension, and a bradycardia.

Laboratory Findings: Blood count was normal; hemoglobin 96 per cent., red blood count 4,600,000, white blood count 6,000, and the differential revealed 32 per cent. lymphocytes. Urine, blood Wassermann and Kahn were negative. Blood sugar was 62.5 mg. per 100 c.c., N. P. N. 30.7 mg., and creatinine 1.36. Roentgenogram of the chest was negative for tuberculosis.

Progress: The patient was placed on a high caloric diet with injection of five units of insulin before each meal in order to stimulate his appetite. He gained six pounds, from 104 to 110, in six weeks, and then remained stationary. Mentally, he remained unchanged: he was markedly listless and seclusive; would crawl into bed whenever permitted; or if dressed would sit in a chair with head resting on pillow of an adjacent bed.

On November 5, 1935 a basal metabolic test was taken with the surprising finding of a reading of —45 per cent. A few days later it was —37 per cent. and two weeks later —41 per cent. Glucose tolerance test (see tables) revealed a very high tolerance with a very slight rise after the intake of glucose.

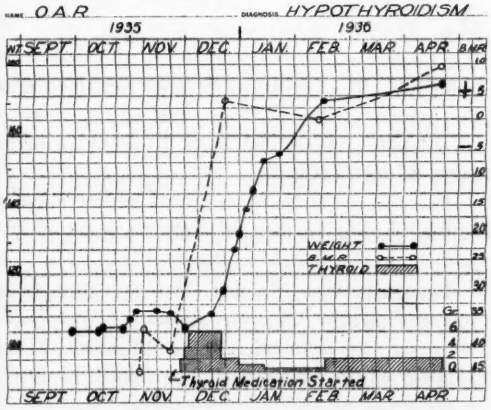
GLUCOSE TOLERANCE TEST

November 6, 1935		January 4, 1936	
Time	Mg. of blood sugar	Time	Mg. of blood sugar
Fasting	80.0	Fasting	86.5
30 min.	93.0	30 min.	106.3
60 min.	93.4	60 min.	72.7
90 min.	80.0	90 min.	101.0
120 min.	84.0	120 min.	80.0
180 min.	90.9	180 min.	61.0

Patient was placed on small doses of desiccated thyroid, starting with two grains a day, gradually increasing up to six grains a day, then decreasing to two grains a day, and finally to one-half a grain a day. After a slight loss, he gained eighteen pounds in weight during the first month and the basal metabolic rate changed to +4 per cent. With this physical improvement, this dull, apathetic individual became an active lad, interested in his surroundings and with partial insight into his mental illness. The second month, he gained an additional twenty-eight pounds, and now weighed 156, as compared to his previous weight of 104. His glucose tolerance test (see tables) at this time showed an improvement, although he still had a moderately high tolerance. In February, 1936, the patient was discharged from the Elgin State Hospital, improved, mentally and physically. His basal metabolic rate was 0 per cent. and he weighed 171 pounds.

Under the observation of his family physician this patient has continued for the past two years on thyroid therapy, the dosage varying between one and three grains daily. In April, 1936, his basal metabolic rate was +9 per cent., in October, 1937, —1 per cent. and in March, 1938, +4 per cent. He has remained at home since his discharge, adjusting well in his community, and working daily with his father.

GRAPHIC CHART OF WEIGHT, BASAL METABOLIC RATE AND THYROID THERAPY



Graphic Chart of Weight, Basal Metabolic Rate and Thyroid Therapy.

This case is reported as one of the severe hypothyroidisms belonging to the grouping of non-myxedematous hypothyroidism. The final test of the diagnosis was the marked physical and mental improvement under thyroid therapy with the return of the basal metabolic rate to normal.

The nature of the psychosis is debatable, whether it was primarily schizophrenia with a thyroid deficiency or primarily due to hypothyroidism with a schizophrenic coloring. The authors consider the patient primarily a schizophrenic, markedly influenced and affected by the severe thyroid deficiency. The marked physical improvement produced an associated mental improvement.

Contrary to accepted text-book teachings of hypothyroidism, overweight and obesity are not necessarily symptoms of thyroid deficiency. Although overweight is a common accompanying symptom, underweight frequently occurs. According to Lawrence[2] thyroid deficiencies may be accompanied by weight abnormalities, obesity being more common in the older subjects, while underweight occurs more frequently in patients with hypothyroidism developing during the period of body growth. Our patient who became ill at the age of twenty would fit into this category. Warfield[3] in his study of 88 cases of hypothyroidism found that 24% had gained weight, 25% were underweight, and 51% had no weight change. In a report of 100 cases of hypothyroidism Fortune[4] found 10% to be definitely underweight. White[5] recently reported 90 cases of hypometabolism with basal range between —11% and —42%, and states that most of the patients' weights were normal, although some were underweight.

SUMMARY AND CONCLUSIONS

1. The suggested groupings of adult thyroid deficiencies are (a) hypothyroidism, without myxedema; (b) myxedematous hypothyroidism; and (c) non-myxedematous hypothyroidism.

2. Non-myxedematous hypothyroidism should be restricted to severe cases of thyroid deficiency with basal metabolic rate of —30% or lower, with the absence of classical signs of myxedema.

3. A case is reported of an emaciated, young male adult with psychosis of a schizophrenic nature, a marked degree of physical and mental fatigability and a basal metabolic rate of —45%. Under thyroid medication the basal metabolic rate returned to normal. The patient gained 67 pounds in three months, improved mentally and was discharged from the institution. Dur-

ing the past two years thyroid therapy has been continued and the basal metabolic rate has remained normal.

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PATHOLOGY OF PNEUMONIA

Review of 150 Cases of Lobar Pneumonia in 3,585 Autopsies

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CHICAGO

As early as 1819 Laennec accurately described the gross pathological changes in pneumonia, and the description is classical today. In 1881 Pasteur and Sternberg independently noted diplococci organisms in the sputum of pneumonic patients, and it was not until 1884 that Fraenkel proved the pneumococcus to be the exciting agent. His work was later corroborated by Weichselbaum.

For many years it was the opinion of workers that pneumonia involved the lungs by way of the blood stream, and it was not until 1920 that the pathogenesis of lobar pneumonia was accurately described by Blake and Cecil. These two workers produced the infection by injecting pneumococci into the trachea of monkeys and observed the pathological changes in the lungs. The animals were usually sacrificed on succeeding days and careful studies were made. They observed that mere spraying of the pharynx and larynx with bacteria was without effect. They also noticed that the earliest changes occurred at the hilus of the lung and the process spread to the periphery like a wave. Microscopically the interstitial tissues showed early invasion of the pneumococci before reaching the alveoli. There was also perivascular and peribronchial infiltrations of leukocytes and mononuclear cells. This was soon followed by the stage of engorgement, which is characterized by a marked congestion of the blood vessels and extravasations of red blood cells into the alveolar spaces. This early stage of pneumonia is practically never seen at autopsy, since the process lasts about twenty-four hours. The second stage is that of red hepatization, which lasts up to about the fifth day and is followed by gray hepatization. If the patient survives, complete resolution of the consolidation occurs, with complete re-expansion of the involved parts.

It is remarkable that necrosis seldom follows the pneumonic process. The inflammatory exudate in the alveoli of the lung is disposed of by coughing, by the phagocytic power of the macrophages, and by the ferment action of the leukocytes.

Recently Coryllas and Birnbaum have shown that following the blocking of a bronchus in dogs by plugs of thick, mucoid material, an area of atelectasis results, which is soon the site of a pneumonia. Thus they concluded that the atelectatic portion of a lung is the predisposing factor of the onset of pneumonia.

It must also be emphasized that the occurrence of pneumonia also depends upon the virulence of the infecting pathogenic bacteria and lowered resistance of the affected individual.

The following study constitutes a review of the pathological changes observed in 150 cases of lobar pneumonia. The material was selected from 3,585 consecutive autopsies, performed at the Cook County Hospital from 1936 to 1938 inclusive. The incidence of lobar pneumonia as the primary cause of death was 4.18%, usually considered as the third most frequent primary cause of all deaths.

There were 110 males or 73.3% and 40 females or 26.7%. As to race, 85 were white or 56.7% and 65 were colored, or 43.3%.

The cases were divided into age groups, as follows: ten to 20 years, four or 2.6%; 21 to 30 years, 14 or 9.4%; 31 to 40 years, 26 or 17.4%; 41 to 50 years, 39 or 26%; 51 to 60 years, 35 or 23.3%; 61 to 70 years, 23 or 15.3% and over 71 years there were nine or 6% (see table No. 1.)

From the above, it is apparent that lobar pneumonia in children is very rare while the peak is reached between 41 and 50 years and remains high up to 60 years. The high inci-

Read before the South Shore Branch of the Chicago Medical Society April 27, 1938. From the Department of Pathology, Cook County Hospital.

dence for the latter group may be explained by the fact that the resistance of the individual is frequently lowered due to many associated chronic pathological conditions, as will be shown later.

As to the incidence of consolidation in the various lobes in the 150 cases, the findings here differ somewhat from those usually given in standard text-books. In my series of cases, the right upper lobe was most frequently involved, being affected in 75 cases. The left lower lobe was second, being affected in 72 cases. Third in frequency was the right lower lobe in 63 cases, this usually being given as the most frequent lobe involved. Fourth, was the left upper lobe in 45 cases and the right middle lobe being affected in 39 cases. The entire right lung was involved by the pneumonic process in 21 cases, while the entire left lung was involved in 32 cases. In 70% of the entire series two or more lobes showed consolidation, while 30% showed consolidation in only one lobe (see Fig. 1).

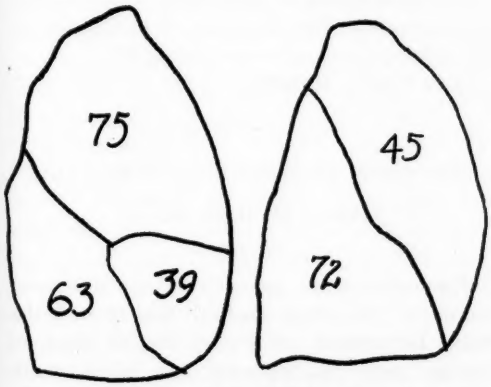

Fig. 1. Incidence of Consolidation in various lobes in 150 cases. Entire right lung involved in 21 cases. Entire left lung involved in 32 cases.

The stage of engorgement or hyperemia, the earliest change to be noted in the lung in lobar pneumonia, was not observed in any of the cases. This stage is usually present only during the first 24 hours of the disease. The changes usually noted were gray hepatization, which usually appeared at the end of the fifth day of illness, and red hepatization when more than one lobe was involved. The stage of resolution, which is the stage of healing, was practically absent except in those cases dying from some complication of the pneumonic process. The involved lung in the stage of resolution is often described as a post pneumonic relaxation evidenced by the loss of elasticity of the lung tissue and complete absence of any inflammatory exudate microscopically.

The complications observed were 1. fibrinous pleuritis in 82 cases or 54.6%; 2. jaundice in 27 cases or 18%; 3. lung abscess in 17 cases or 11.3%; 4. pericarditis in 12 cases or 8%; 5. endocarditis in 8 cases or 5.3%; 6. empyema in 5 cases or 3.3%, and 7. cystitis in 3 or 2% (see table 2).

The pleuritis usually consisted of a fibrinous exudate on the surface of the involved lobe or lobes. Jaundice when present clinically is usually considered as a fatal omen in cases of pneumonia. Empyema is usually a rare complication in adults, being more frequent in children.

It is interesting to note in this series the high incidence of hypertensive heart disease, often present in the patients over 40 years of age. The heart was usually well compensated and showed a moderate to marked degree of hypertrophy in 49 such cases or 32.6%; tuberculosis of the lungs was observed in 17 cases or 11.3%; mitral or aortic stenosis present in 13 cases or 8.6%; nodose goiter present in 21 cases or 14%; hypertrophy of the prostate gland present in 14 cases or 9.3%; chronic cholecystitis and cholelithiasis present in 12 cases or 8%; fibromyomata uteri present in ten cases or 6.6%; cirrhosis of the liver present in four or 2.6% and diabetes mellitus was present in three or 2% (see table 3. The above incidental findings in the 150 cases encountered at autopsy no doubt played a rôle in diminishing the resistance of the individual, thus permitting the pneumonic process to take a fatal course.

Recently it has been shown that clinically too much emphasis has been placed upon the extent of the pneumonic process in the lungs and minimizing the bacteriological studies. It is not so important to know whether one or more lobes of the lung are involved as it is to know the causative organism present. We now know and realize that the advances in the therapy of pneumonia depends to a great extent upon definite bacteriological studies. In 50 of the cases of pneumonia coming to autopsy, bacteriological studies were made. Smears and cultures were made from the involved lung and the predominating organism was determined (see table 4). Sixteen cases showed pneumococci or 32%; these

cases were typed and were as follows; Four were type I; one type II; two type III; one type IV; one type VII; three type VIII; one type XII and two cases could not be typed (see table 5). Streptococci of all types were present in 15 cases or 30%; staphylococci of all kinds in seven or 14% Friedlander's bacillus in five cases or 10%; B. coli in four cases or 8%; influenza in two cases or 4% and m. tetragenous in one case or 2%. The above findings show the high incidence of pneumonia due to other organisms than pneumonococci, thus explaining perhaps the poor results obtained therapeutically in a large number of cases of pneumonia treated indiscriminately with pneumococcic serum.

ANALYSIS OF 150 CASES OF LOBAR PNEUMONIA
AGE GROUP

AGE GROUP						
10-20	21-30	31-40	41-50	51-60	61-70	71-Over
4	14	26	39	35	23	9
2.6%	9.4%	17.4%	26%	23.3%	15.3%	6%

SEX—MALES 110 (73.3%) FEMALES 40 (26.7%).
RACE—WHITE 85 (56.7%) COLORED 65 (43.3%).

Table 1.
THE INCIDENCE OF CONSOLIDATION IN THE VARIOUS LOBES IN 150 CASES BACTERIOLOGICAL INVESTIGATIONS IN 50 CASES OF PNEUMONIA COMING TO AUTOPSY

Predominating Organisms	No.	%
Pneumococci	16	32
Streptococci (of all kinds)	15	30
Staphylococci (of all kinds)	7	14
B. Mucosus Capsulatus (Friedlanders)	5	10
Bact. Coli	4	8
H. Influenzae	2	4
M. Tetragenous	1	2
TOTAL	50	100

Table 2.
INCIDENTAL FINDINGS IN 150 CASES OF LOBAR PNEUMONIA

1. HYPERTROPHY OF HEART	49 cases	32.6%
2. NODOSE GOITER	21 cases	14.0%
3. TUBERCULOSIS	17 cases	11.3%
4. HYPERTROPHY OF PROSTATE	14 cases	9.3%
5. MITRAL & AORTIC STENOSIS	13 cases	8.6%
6. GALL STONES	12 cases	8.0%
7. FIBROIDS	10 cases	6.6%
8. AORTITIS (LUETIC)	9 cases	6.0%
9. CIRRHOSIS OF LIVER	4 cases	2.6%
10. DIABETES MELLITUS	3 cases	2.0%

Table 3.
TYPING OF 16 CASES OF PNEUMOCOCCIC PNEUMONIA

Type	I	II	III	IV	VII	VIII	XII	XIV	Not Identified
Cases	4	1	2	1	1	3	1	1	2
%	25	6.25	12.5	6.25	6.25	18.75	6.25	6.25	12.5

Table 4.
COMPLICATIONS OF THE PNEUMONIC PROCESS

1. FIBRINOUS PLEURITIS	82 cases	54.6%
2. ICTERUS	27 cases	18.0%
3. LUNG ABSCESS	17 cases	11.3%
4. PERICARDITIS	12 cases	8.0%
5. ENDOCARDITIS	8 cases	5.3%
6. EMPYEMA	5 cases	3.3%
7. CYSTITIS	3 cases	2.0%

CONCLUSION

An analysis of 150 cases of lobar pneumonia coming to necropsy is described. In 70% of the cases two or more lobes were involved in the pneumonic process. The right upper pulmonary lobe was the most frequently affected (in 75 cases) and the left lower lobe second in 72 cases. Jaundice was noted in 18%, lung abscess in 11.3% and pericarditis in 8%. Essential hypertension and hypertrophy of the heart was present in 49 cases or 32.6% as an incidental finding at autopsy. An exact bacteriological etiology is emphasized in order to institute specific therapeutic measures.

The above review is based upon 3,585 consecutive autopsies. The incidence of pneumonia as the primary cause of death was 4.18%.

Cook County Hospital.

PROGRESS IN MATERNAL WELFARE

HAROLD H. HILL, M. D.
CHICAGO

The educational program being developed jointly by the State Medical Society and the State Department of Public Health aims to further lower the maternal and infant death rate in Illinois. This can only be done by the earnest cooperation of all organizations and individuals concerned. It is generally accepted that from 50 per cent. to 75 per cent. of these deaths are preventable and this would reduce the number of those dying from maternal causes, using the 1937 figures, from 437 to 218, those from infant causes from 4,965 to 2,482. This is surely a most worthy aim.

A series of programs carefully planned by the educational committee of the State Society and the Advisory Committee to the State Health Department have been given in ten sections of the

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Presented before Obstetricians and Gynecologists Meeting, 98th Annual Meeting, Illinois State Medical Society, Springfield, May 17, 1938.

State this year on obstetric and pediatric subjects to County Medical Societies. It has been the aim of these series of courses to bring to the doctors a group of interesting speakers on phases of the subjects of particular interest to the general practitioner. We are fortunate to have available to the profession some of the leading men in their respective fields, and they have repeatedly demonstrated their interest in the program by acceptance of invitations to appear before the county units. Some of these speakers were: Doctors Hess, Isaac Abt, Grulee, Parmelee, Danforth, Baer, Falls, Schwarz, Dieckman and Cornell. Some of the general subjects presented have been on the care of the newborn, the premature infant, prevention of contagion, infant feeding, the management of obstetric hemorrhage, toxemias, puerperal infection and prolonged labor. In general the attendance has been good and interest stimulated and maintained.

A large collection of lantern slides illustrating these subjects has been created since the supply and nature of the existing material was deemed inadequate and unsatisfactory. Two exhibits, one for lay audiences and one for the physicians, have been produced this year for the Annual Meeting of this Society. The lay exhibit portrays the essentials of prenatal care, the scientific exhibit concerns puerperal fever. Plans calling for their distribution throughout the State under the guidance of the Maternal Welfare Committees of the County Medical Societies have been made. The one may be shown at county and district meetings of lay organizations, the other before County Medical Societies, their district meetings and in hospitals. Demonstrations can be arranged through my office at 30 North Michigan Avenue, Chicago.

The Maternal Welfare Committee of the State Medical Society is organizing a program which will be offered as a suggestion to the County Societies—plans for studying the needs of their particular community in such a way as to give a better knowledge of their obstetric and pediatric problems, viz.: maternal and infant death rates and their causes, the number dying at home and hospital, what the nature of their medical supervision was, the matter of hospital facilities, etc. We desire to first find out what is killing our mothers and babies, then devise ways and means to prevent as many deaths as is humanly possible.

In three counties of the State—Hancock, Ford, Menard—the County Society has become very active in efforts which should offer some solution of the morbidity and mortality problems in their county. They have worked out details of plans for a special nursing service that offers prenatal care, home delivery service (in one of them), and postnatal follow-up. A similar service has been requested in Greene and Fulton Counties and will be started soon.

The maternal and infant death rates in 1937 in Illinois were the lowest in the State's history, being 3.7 and 43 per 1,000 births respectively. Compared with a decade ago in which the rates were 5.3 and 64.4 we see a saving of the lives of 162 mothers and 2,461 babies, certainly a marked improvement. This is due in no small part to the general interest and thought being contributed to the problem by professional and lay persons alike. Illinois in 1936 had a maternal death rate of 4.5 per 1,000 live births, was exceeded by eight states, namely: Rhode Island, New Jersey, Connecticut, Wisconsin, Minnesota, North Dakota, Utah, and Idaho. The infant death rate was 47 and she was exceeded by only six states, namely: Connecticut, Minnesota, Nebraska, New Jersey, Oregon and Washington.

The accomplishments which have been made in certain controlled programs of certain areas offer a challenge to be met by State Medical Societies, State Departments of Health, and civic and lay organizations. Illinois seems well on the way to a realization of these desired objectives.

30 N. Michigan Avenue.

THE TREATMENT OF ADDISON'S DISEASE

Edward H. Rynearson, Rochester, Minn. (*Journal A. M. A.*, Sept. 3, 1938), discusses the treatment of Addison's disease by presenting hypothetic case histories, which include the patient in a crisis of Addison's disease, the patient with Addison's disease who requires an operation, the patient with chronic Addison's disease and the patient suspected of having Addison's disease. Progress in the treatment of Addison's disease is being reported and it is believed that the best available treatment should consist in (1) the restriction of potassium in the diet, (2) the addition of sodium salts to the diet, (3) the use of an active extract of the adrenal cortex when it is needed, (4) the training of the physician and the patient in the details of treatment of the chronic state of the disease and (5) the early recognition of acute remissions and their energetic treatment.

STUDY OF THE TREATMENT OF EPILEPSY

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The problem of epilepsy viewed from any angle —medical, social or economic—is a widespread and serious one, and yet comparatively speaking epilepsy has been a neglected field. In the United States alone, there are about one and one-half million persons subject to epilepsy. These have only the extremes of care in the home, or in large publicly supported institutions into which the dregs of the patients have settled.

The past history of these epileptics who have finally landed in publicly supported institutions may, in general, be summarized in the following manner: They were at first under the care of the general practitioner, the majority of whom have the general conception and follow the general methods of diagnosis and of treatment which were obtained from twenty to fifty years ago. Receiving no help from this direction the patients then succumb to the intensive high-pressure methods of drug vendors, who now put out scientific looking pamphlets, which claim to present the consensus of medical research. Finally, with the family resources at a very low ebb, and the patient's degree of mental deterioration at such a degree that hospitalization is imperative, the patient is brought to a publicly supported institution.

The sad plight of the epileptic is not terminated at this stage. Having entered the portals of the impressive looking institution and having been classified as an epileptic, he is at once, consciously or unconsciously, cataloged as an incurable and hopeless case and as such is assigned to a chronic ward, segregated with other epileptics and merely given custodial care.

We can thus see that there is both the need and the opportunity to handle the problem of epilepsy in a manner somewhat different from the conventional method. If, for the time being, we put aside Dr. William G. Lennox's idea of erecting epileptic colonies for these unfortunates, and put our shoulders to the wheel, there is much that we can accomplish with the conditions as they are—although they are far from ideal.

"The outlook for a patient suffering from epilepsy is not so hopeless as the laity and some physicians regard it . . . by proper and sustained treatment we can restore health after a number of years, so that the patient may continue free of attacks without medication. In another group the patient may be made convulsion-free and so maintain a normal social existence by the continued use of medication—a small price to pay for health. In some, the attacks may be diminished or so modified that only very light, momentary lapses of consciousness occur instead of convulsions, and the patient may indulge in normal activities without fear of injury or overt recognition of his affliction."

Now we are ready to tackle the problem as it stands. We will find in each institution a group of epileptics, with or without psychosis and with a greater or lesser degree of deterioration. Most of them have received luminal but few have benefited by its haphazard administration. What then are we to do?

We of the Jacksonville State Hospital have tried to solve this problem. As yet, it is too early to state whether or not we are on the right track, but though we may have made a false start we are presenting this paper not as a final report, but rather as a work sheet so that we can get the opinion of the staff members of the other institutions and also learn what they are doing in this particular line, so that we may benefit by their experiences.

In the first place, we have, on the basis of mentality, placed the epileptics into three groups. In the first group we include patients who are normal or nearly normal mentally. They have an I. Q. of nearly 80 or above and an outlook which, if the seizures can be controlled, justifies the hope of a productive place in society. In the second group we have placed the patients who are definitely deteriorated and short of some miracle can never again be useful members of society. Yet even these patients have once been normal and even now are able to feed themselves and enjoy small pleasures and do small tasks. In the third group we have the congenital idiots and imbeciles who by no imaginative possibility can ever be anything better.

We now face the problem of the treatment of these epileptics. Since our study was confined to the so-called cases of idiopathic epilepsy, and since rational therapy is not possible until the pathogenesis of idiopathic epilepsy is fully elucidated, we had to resort to symptomatic treatment. Dealing, as we are, with institutional cases, our problem was very different from that which faces the physician on the outside. Our

Read before Physicians Association, Department of Public Welfare, State of Illinois, at Meeting of Illinois State Medical Society, May 17, 1938, Springfield.

object was to decrease or entirely suppress the number of attacks. Such therapy has no curative element other than that patients who can be kept free from attacks for a sufficiently long period of time tend to lose the habit. The control of attacks also allows the patients to lead a more or less active life within the institution and prevents possible damage to the brain in the form of post-convulsive lesions.

The medical treatment of epilepsy consists partly in the administration of drugs designed to arrest attacks or to render them less frequent and less severe. Many drugs have been of service in the past: chloral, borax, potassium or sodium borotartrate and digitalis. These are of some value in particular types of cases. The two outstanding anti-convulsants at the present time are bromide and phenobarbital. As to whether one is superior to the other is difficult to state. The consensus of medical opinion is that luminal is superior to bromide in moderate epileptic involvement where the patient is trying to work and therefore desires to avoid as much psychic dullness as possible. It is presumably free of the undesirable effect of the bromides, but frequently causes a "dopey" feeling. Phenobarbital is effective chiefly in the grand mal seizures, but is not so good for minor attacks. It carries one grave danger, sudden cessation of intake may precipitate a status epilepticus.

Bromide is probably the most effective anti-convulsant. It has been used successfully since 1853. The objection to the continued use of bromide is that the patient becomes stuporous and mentally sluggish. When the drug is pushed to the point of stopping attacks, the mentality, oftentimes has also been slowed to the point at which the cure is worse than the disease. These disadvantages have probably been overemphasized. The possibility of permanent damage due to histological changes through prolonged use of the bromides is rare, if it exists at all. Studies on non-institutional cases show that the idea of "bromide brutalization" and "bromide deterioration" are not justified. These ideas are due chiefly to the failure to distinguish between deterioration and intoxication, to the use of bromide in patients destined to deteriorate anyways, and to the chance behavior disturbances in patients who had received bromides and in whom such disturbances had occurred without bromides.

The advantages of bromide therapy are: that in the majority of cases its influence is incomparably greater than any other remedy; that its influence is less transient than that of any other drug, and that it is excreted slowly. The slow excretion is a safety factor, because the blood bromide level remains constant even if the patient happens to skip a few doses. The level is easily controlled by the easily obtainable reading and the oral dosage adjusted.

In using bromides every patient must be experimented with to determine the best dose, and when large doses are given periodic check ups of the blood content should be made to avoid bromide intoxication. The bromides displace the chlorides in the blood, but the anti-convulsant action is a pure bromide-ion action. Optimum anti-convulsant effects are obtained when the blood bromide level is between 225 to 275 mg./100 cc. of blood. One must not carry the process too far. Evidence of overdosage of bromides, so-called "bromism" is seen as an ataxia of gait and arm movement, thick-coated tongue with slurring speech, mental obtusion approaching stupor, sleepiness and not infrequently psychotic periods. This is easily remedied by stopping the bromides and substituting chlorides until the abnormally high bromide level drops.

Taking into consideration all of these factors, and being personally of the opinion that under existing conditions the bromides would probably prove the more effective of these two anti-convulsants, we decided to put most of our cases on bromide therapy. These patients have now been under observation for three months. Because of the shortness of the period of observation, we are merely presenting a preliminary report and are not drawing any definite conclusions.

For convenience's sake, this experiment was limited to the female epileptics on one ward. The past histories of all of these patients are very similar. They have all run the gamut of private practitioners and the various patent medicines and have finally landed here.

These patients were divided into four groups and each group was treated differently. Group one consisted of five patients who have had convulsive seizures for from fifteen to twenty-eight years, and who have been in institutions for from one to fifteen years. They were placed on a triple bromide mixture. In December they received twenty grains of bromides three times daily in this liquid mixture. During January and February the dose was reduced to forty-five

grains daily. The effect of this medication is shown in the table below.

TABLE 1

	November	December	January	February
Convulsions for Month	17.000	11.000	7.000	15.000
Convulsions per Day	0.566	0.355	0.223	0.535
Convulsions/Day/Pt.	0.155	0.071	0.045	0.107

The marked rise of the number of convulsions in February was due to an increase in convulsions in two of the patients. The remaining cases continued to show a decrease in the number of convulsions. The increase in convulsions varied inversely with the blood bromide concentration as illustrated in table two.

TABLE 2

	January		February	
Case:	Blood Bromide Concentration	Number of Convulsions	Blood Bromide Concentration	Number of Convulsions
N.W.	200 mg/100cc	0	140 mg/100cc	5
G.C.	300 mg/100cc	1	150 mg/100cc	7

These two cases well illustrated the existence of the wide individual differences between epileptics as to the optimal bromide saturation. In some patients seizures are controlled by as low a level as 100 mg./100 cc. of blood; in others, one has to go to 200 or 300 mg./100 cc. Good results can be obtained only by a chemical study and control of the patient's blood bromide. It is wise to keep the patients slightly above the lowest level at which convulsions have disappeared. This slightly increased level will guard against the effect of any sudden intake of salt.

Group two, consisting of six patients who have had convulsive seizures for from ten to fifty years, and who have been in institutions for from one to ten years, were placed on triple bromide tablets. They received one 7½-grain tablet three times daily for a total of 22½ grains of bromides daily. This medication was continued through December and January. The effect of this medication on the number of convulsions is shown in table three.

TABLE 3

	November	December	January
Convulsions for Month	26.000	59.000	68.000
Convulsions per Day	0.866	1.903	2.193
Convulsions/Pt./Day	0.144	0.317	0.365

The marked rise in the number of convulsions may be due to several factors. Firstly, it may merely be another illustration of the oft noted fact that the bromides seem to lose their effect after an unsuccessful administration of luminal; secondly, these few months may be considered as a transitory period following an unsuccessful administration of luminal and during which time small doses of bromides were given and the blood bromide concentration had only reached the lower and ineffective levels; thirdly, this group may have had several "recalcitrant" patients.

Taking all of these factors into consideration we subdivided this group into two smaller groups. Sub group A, consisting of three patients who had shown only a moderate increase in the number of convulsions; and sub group B, consisting of three patients who had shown a marked increase in the number of convulsions. The former were put on a triple bromide mixture and received four-fifth grains of bromides in this liquid mixture, while the latter were placed on luminal, receiving half-grain tablet three times daily. Both sub-groups benefited by this changed in medication.

The results are tabulated below.

Table 4.

	January		February	
	A.	B.	A.	B.
Convulsions for Month	15.000	53.000	6.000	21.000
Convulsions per Day	0.866		1.903	2.193
Convulsions/Pt./Day	0.163	0.569	0.071	0.273

Group three consisted of three patients who have had convulsive seizures for from thirty-seven to forty-one years and who have been in institutions for from six months to twenty-four years. They were given fifteen grains of sodium bromide and one grain of luminal in a capsule, receiving three such capsules daily. This medication has been continued to the present time. One of the patients in this group was transferred to another ward and has been dropped from consideration in the tabulations of the January and February results. The results of this group are tabulated in table five.

Table 5.

	November	December	January	February
Convulsions for Month	16.000	16.000	8.000	10.000
Convulsions per Day	0.533	0.533	0.258	0.342
Convulsions/Pt./Day	0.177	0.177	0.129	0.171

Group four was kept on luminal. The number and the character of the convulsions have shown no essential changes and hence on tabulated results will be presented at this time.

Several of the patients have received individual treatment because of the special character of their cases, but these cases will be discussed in another paper.

Comment. The problem of epilepsy is a very serious one and merits much more consideration and serious attention than it has been getting in the past. It has not yielded to individual efforts,

but a cooperative attack should give a larger hope of ultimate success.

It is logical to assume that the place to study epilepsy is among the large number of patients housed in public institutions. These institutions have members on the staff who could put to large scale clinical tests newly developed ideas and make observations of therapeutic procedures and drugs. The results of themselves would be of value, but even more important, the morale of the patients and the staff would be raised. It was with this view in mind that this problem was undertaken and that this paper is presented. Because of the small number of cases and the brief period of observation, no definite conclusions can be drawn, but it is hoped that this paper will stimulate some interest in this age-old problem and encourage further work and an exchange of ideas between staff members of the different institutions.

The majority of epileptics in state institutions, regardless of the number and character of their convulsions, the duration of their symptoms and the absence or presence of psychosis or deterioration can be benefited by proper medical procedures. While it is true that the use of anticonvulsants has no curative element, yet we must not lose sight of the fact that the control of attacks will allow the patients to lead a more or less active life within, and sometimes even without the institution and prevent possible damage to the brain in the form of post-convulsive lesions.

CONCLUSIONS

1. All cases receiving large doses of bromides and whose blood bromide concentration had risen to the point approximating the optimal concentration level showed a definite decrease in the number of convulsions.

2. Those cases which had undergone an unsuccesful administration of luminal and were then placed on small doses of bromides showed an increase in the number of convulsions, but when the bromide dosage was increased and the blood bromide concentration level rose we noted a decrease in the number of convulsions.

3. Although a blood bromide concentration of 300 mg./100 cc. of blood was reached in several cases, no cases of bromide intoxication were noted during this period of treatment.

DISCUSSION

Dr. Isidore Finkelman, Chicago: The program committee of this section is to be congratulated on choosing Dr. Novick's paper for presentation today. The epilepsy problem has been neglected in state institutions and offers to institutional physicians a fruitful field of research.

Every now and then a report is made of the successful treatment of epilepsy by some new method. For example, snake venom, rabies or brain lipids have been reported as successful agents. However, these and other new methods have proved disappointing and we must continue to treat epileptic patients by older, well-recognized methods. Of these, the administration of bromide or of phenobarbital are the best. As Dr. Novick said, the anti-convulsant action of the bromides is a bromide ion action. The bromides are in general superior to luminal, although there are individual cases in which luminal or a combination of luminal and bromides are more effective. In the Northwestern University Clinic we have 90 active patients treated by sodium bromide or luminal. In 24 (or 26.6%) the attacks were stopped soon after treatment was instituted and they have not recurred; in 20 additional cases attacks were stopped, recurred and then later ceased, making 44 (or 48%). That is to say, in about one-half of the epileptic patients treated in a clinic the attacks can be stopped. This percentage is even larger in private practice.

In our experience, the results with luminal are not so favorable as with bromides. Attacks were stopped in 35% of cases treated with luminal as compared with 48% treated with bromides. However, some of these cases had previously been ineffectively treated with bromides. A large percentage of cases of epilepsy can be controlled by bromides or luminal in cooperative patients.

Jacksonville State Hospital.

NEGLECTED, FORGOTTEN BUT SOME EXTREMELY VALUABLE REMEDIES

Used by the Laity for the Treatment and Supposed Cure of Pulmonary Tuberculosis During the Seventeenth, Eighteenth and Nineteenth Centuries

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From history we learn that the ancients well recognized the disease tuberculosis, which was then recognized as phthisis. Hippocrates (464-376 B. C.), the most eminent physician of antiquity, and regarded as the "Father of Medicine," gave us a good description of this disease as he observed it; and more than fifteen hundred years elapsed after his time before his depiction of

*Deceased.

the clinical nature of phthisis was again reached. He spoke of fever, hemorrhage, cough, pleurisy, pain in the chest, clubbing of the fingers, etc. We are also indebted to Hippocrates' day for the first name of this disease—"Phthisis," which is derived from a Greek word meaning "to pass or waste away." Other names for this disease were added from time to time, and later, as our vocabulary gradually increased, new words came into use for this malady, such as "Consumption" (a gradual decaying or destruction of the body), the scourge, the plague, the pestilence, the wasting disease, the passing disease, etc. The word "Tuberculosis" is of more recent origin and is composed of two words—"tubercle" (a small nodule) and "Ossis" (a morbid condition). Other ancient writers, Aristotle (384-322 B. C.), Celsus (30 B. C.-50 A. D.), Galen (131-201 A. D.), all recognized this disease, but no special method was devised nor advocated for the cure of the consumptive. From Galen's time until the sixteenth century with the possible exception of Avicenna (980-1037 A. D.), an Arabian physician, no mention in their writings is made of consumption as a disease entity. In that century the first attempt was made at an anatomical and physiological orientation; however, no attempt at a treatment was made until the common people by customs and beliefs—the folklore—advocated, from family to family, from mouth to mouth, the use of home remedies.

With the discovery of this continent and the recognition of so many various roots, plants, herbs etc., as potential medicaments and their introduction into the European markets, the interest in the care of the consumptive became more in evidence, while the home treatment soon developed into a commonplace practice. The attention shown the consumptive at that time consisted of the giving of infusions and decoctions made from those newly discovered roots and herbs, the giving of animal derivatives, animal fats and animal blood; and even animal dung, or excreta, was vaunted as a sure cure for consumption. Castoreum, the two glands found in the inguinal region of the beaver, is a drug that has been much in use since the time of Hippocrates until approximately one hundred years ago, but it is now entirely discarded by the Standard Pharmacopoeias—is no longer official. In the lower abdominal area, or in the lower pelvic region of the beaver near the inguinal glands, large quantities of fat are always found. This fat was vaunted as a cure for consumption and was much in demand at one time; but since the discovery that castoreum is of no special medicinal value, and since its discontinuance as a therapeutical compound and as a recognized pharmaceutical preparation, beaver fat has also been discarded as a salutary aid in this malady.

During a certain period in history the beaver was considered the most valuable of all animals when every part of its body was highly recommended at some time or another for the treatment of the various human ailments. Even as early as the year 1540 various parts of the beaver's body were very much prized for their great curative properties. In the early days of Hippocrates the use of castoreum was lauded for mental disturbances in women, for epilepsy, for hysteria. In the last few centuries the inguinal glands (castoreum), when thoroughly dried, comminuted, and ground up, were macerated in alcohol and so a tincture was prepared. This solution was then given to women in uterine disturbances, in spasms, in epilepsy, in hysteria, in menstrual disturbances, in nervous complaints as an antispasmodic, etc. The beaver fat was given to the consumptive as the most dependable remedy for the cure of the disease. The teeth of the beaver were strung like beads, then placed around the neck of the teething infant and worn an an emulet, or talisman, to relieve the slow teething process. The beaver's hair was used to stop local hemorrhages when applied directly upon a wound. The flat tail of the animal was roasted to a turn and served as a delicious morsel, satisfying the most fastidious epicure; and the fur was fashioned into stylish capes and garments. About 1607 the Hudson Bay Company exploited the Northwestern Territories and again brought the beaver prominently, but only temporarily into the field of medicine and economics. Before the discovery of this country the beaver, as a profitable animal, was brought from the northern part of Europe, from Russia and other northern countries.

The remedies used for the treatment and supposed cure of the consumptive may be grouped into four classes:

CLASS A

Preparations of animal derivatives or of ani-

mal origin. For the treatment of tuberculosis all kinds of fats and oils, mainly of animal origin have been much in use. The common people, particularly the country folks, were inclined to demand these various fats and oils from the apothecaries and often these demands exceeded the supply. In order to accommodate these requests the apothecaries prepared a mixture of ordinary hog's fat, or lard, two or three parts, and one part of cottonseed or sesame oil. This mixture is very similar in color and consistancy to the ordinary fats. When a demand was made for a certain animal fat, this particular fat asked for and the various other special fats requested from time to time were usually supplied from one and the same ointment jar. Incidentally, it may be remarked here that out of this common ointment jar in the apothecary shop many other fats and oils were dispensed as, for instance, snake oil. During the summer and fall seasons when the circus visited the various villages and towns and the children saw the many acrobatic stunts performed, snake oil was then much in demand for rubbing along the unyielding spine or over the inflexible muscles of the back; and, logically, the apothecary shops were considered the proper places to go for genuine snake oil.

1. *Fats and Oils.* Of the many fats that were offered in the treatment of the consumptive, the following may be mentioned:

(a) Axungia Caninus; Adeps Caninus. (Dog Fat). Of the various animal fats, dog fat has for many years been considered of especial value for the cure of the tuberculosis individuals. In the northern part of our country, which was settled by people from middle and northern Europe, if a member of the family was consumptive, a good-sized dog was obtained and after being gelded was securely fastened so that he could not run about freely. Being so closely confined, within a short time he became quite fat, when he was slaughtered like a hog. The so procured fat was carefully stored away and the consumptive member of the family would be given about a tablespoonful of this fat three times a day. When the supply of fat began to run low, another dog was secured and treated in a similar manner, so that there would be no shortage and the patient would always have the necessary medication. However, it was known that should the supply give out at any time, dog fat could always be secured at a nearby apothecary shop.

(b) Axungia Castori; Adeps Castoris. (Beaver Fat). The fat of the beaver as aforementioned, was extensively used in the seventeenth and eighteen centuries. In pharmaceutical parlance, it was known simply as "Adeps Castoris." As stated before, after the removal of the inguinal glands from the beaver, large quantities of this fat are found in the pelvic region but with the disuse of castoreum as a medicament more than a hundred years ago, beaver fat also lost support as a curative agent.

(c) Axungia Ursina; Adeps Ursinus. (Bear's Grease or Fat) and Axungia Anserini; Adeps Anserinus. (Goose Fat.). During the last two centuries these two fats were much in use for the treatment and cure of the consumptive; and also in the case of these supposed remedies when the supply was found to be short, the ointment jar in the apothecary shop would supply the demand.

(d) Oleum Jecoris Aselli; Oleum Morrhuae. (Cod Liver Oil). This oil is prepared from the liver of the cod fish. The better quality of this oil is usually obtained from the Lofoten Islands near the northwest coast of Norway, and other islands near Bergen, Norway. The oil obtained from the liver of the cod frequenting our northern seas is also of good quality, but it has not gained so valuable a reputation as the Norwegian oil. All the good oils are usually of a light yellow color; but darker oils of very good quality are also offered and for the treatment of the consumptive it was in active demand for many hundreds of years. In the large cities throughout the country the apothecaries of Norwegian descent have had the first opportunity to sell this product. It is shipped to this country in 50-gallon tin containers, and on its arrival in the fall it is at once put into pint bottles of glass and an attractive display made of them in drug store windows. The public considered that the administration of this oil to the sick had a most beneficial influence in nourishing and strengthening the diseased individual, hence its favorable effect when given to the consumptive.

For many years it was deemed more advantageous, more helpful to the consumptive if a small amount of iodine was incorporated with

cod liver oil, so .01% of iodine was added to make it especially efficacious. About one hundred years ago cod liver oil was considered the most valuable of all the various animal fats and oils for the treatment and cure of consumption; however, at the present time its use is very limited for that purpose.

2. *Other Animal Products Used*: (a) Lac Vaccinum; Milk. (Cow's Milk.) For many hundreds of years milk was regarded as one of the best health measures, the most complete food and being highly recommended for the cure of the consumptive, the patients acquired the habit of drinking it in large quantities. Physicians have always prescribed and encouraged the phthisical to dring a litre or two of milk daily. With the opening of hospitals, known as "Sanatoria" for the care of consumptives, a considerable number of these institutions came into existence for this class of patients in which the daily nutriment consisted of an exclusive milk diet—nothing but milk. Quite a few of such institutions were also established in the United States during the last century, one of which I visited at that time. It was a good-sized sanatorium, in a fairly large city in southern Minnesota and this exclusive milk diet for the consumptive was then in vogue in that institution. The treatment of the patients began about seven o'clock in the morning and continued until seven or eight o'clock in the evening. The milk was administered to each patient and given warm, lukewarm, cold or ice cold to suit the individual case. Every half hour a nurse would bring in a fresh supply consisting of eight ounces or one-half pint of milk to be consumed within the following half hour. Many patients would drink from one and one-half to two gallons of milk during a day, and I have been informed that some would drink even three gallons daily. On a consumptive's arrival at the sanatorium he was put to bed and his temperature taken three times daily. If his temperature was found to be above normal, he was not allowed to leave his bed. This exclusive milk diet was continued for many, many months, with much rest and no exercise. Most consumptives showed a marked improvement and gain in weight in due time. Every evening a mild saline cathartic was administered to the patients, and early each morning a colon flushing was given with lukewarm water containing a teaspoonful of glycerine and a little epsom salts. These sanatoria, in which the exclusive milk diet was the prevailing rule for the consumptive have long since abandoned this curative process. I can recall one such institution in Canada and a few throughout the United States, but all of them have now changed their method of treatment for the consumptive.

(b) Lac Capra. (Goat's Milk.) The goat is often referred to as the "cow of the poor." The milk is easily digested, very nutritious and is most useful for the care of the consumptive. The yield of milk is not very great, the daily average being about two quarts. During the past and present centuries goat farms have been much in evidence; and although goat's milk has no special superiority over cow's milk, the consumptive is so obsessed with the belief that goat's milk is more beneficial in his case, that he demands goat's milk. The charity consumptive will always insist on having goat's milk for himself, reasoning, that if goat's milk commands a higher price it must be better. The truth is that cow's milk, of fairly good quality, may be given freely for tuberculosis, as well as for any wasting disease; however, as goats are infrequently tuberculous, the milk of the goat is always free from the tubercle bacillus, so that the patient has less chance, if any, of becoming reinfected from that source.

(c) Lac Fermentatum; Kumiss or Koumiss. (Fermented Milk.) As a beverage for the consumptive, fermented milk dates back into ancient history. The Tartars on the steppes of their ancient holdings in Asia, at Kalmauk, and at other abodes, used fermented mare's milk very extensively. This milk was known everywhere as "Koumiss." Throughout the civilized world a similar beverage is made from cow's milk, which was quite prevalently used in the last century. Ordinary pure cow's milk, mixed with an equal quantity of skimmed milk, to which is added sugar and a definite amount of yeast, is set aside for 36 to 48 hours, when the cheesy matter will have subsided; then the clear whey is poured off, strained and put into clean empty quart champagne bottles, which are securely corked and wired, placed in a cool place and in about three or four days the "Koumiss" is ready to drink. Koumiss must then be con-

sumed within ten or twelve days, as, after that time, it undergoes an acid fermentation, becoming merely a vinegar mixture and is unfit to drink. During the last century in many of the large cities of our country the purchase of Koumiss at a bar was common but it gradually lost favor, due no doubt, to the rapid change it undergoes in a few weeks. It is questionable if a consumptive is benefited by drinking Koumiss; however, its pleasing taste and slight stimulating effect were much sought after by the unfortunate patient. Although Koumiss was much vaunted as a good remedy for the treatment and cure of the consumptive, its dear price did not make it very popular. It was highly recommended for its tonic and stimulating effect, which was due to its small alcoholic content and was very much relished by the consumptive—and by the non-consumptive as well.

(d) Lac Asininum (Asses' Milk) and Lac Ebutyratum (Butter-free Milk, Debuttered Milk or simply Buttermilk.) These two milk products may be mentioned here as medicine for the consumptive patient.

(e) Sanguis Bovinus. (Beef Blood.) The fresh blood of the ox, bull, cattle, etc. The blood was secured at the abattoir or slaughter-houses and in order to avoid its early coagulation, a little citrate of sodium was added to the fresh blood taken from the cattle. In the last century the consumptives went to the abattoirs every morning in groups of twenty to forty patients, each one carrying his own drinking utensil and secured a prescribed amount for consumption at that time; all returning every afternoon for a second allowance. Among consumptives the belief always prevailed that their sickness was caused by impure blood in their bodies and that by taking pure blood into the body by swallowing, it would replace the impure blood in their veins and cure the disease. Until some fifty or one hundred years ago the drinking of blood at the abattoirs was thought medicinally proper but since that time it has not been considered good therapy.

(f) Sanguis Taurinus or Bovinus Inspissatus. (Dried, Exsiccated Beef Blood.) By the time the demand for the ingestion of fresh blood had increased among the consumptives sufficiently to warrant, pharmaceutical firms conceived the idea of evaporating the liquid out of the blood and then they offered this dried blood for sale in powdered form. This exsiccated or dried blood did not sell very readily as the drug was so expensive it was found that most consumptives could not afford to pay the price asked and the gradually decreasing sales proved its unpopularity.

(g) Pepton; Pepton Carneum. (Beef Pepton.) Owing to the easy assimilability and ready digestibility of beef pepton, it is highly prized by the medical profession and for many years was recommended for the treatment of consumption. However, it has now lost favor as a remedy for the cure of this disease, but for its general treatment it is still supported as a nutrient.

(h) Helices and Limaces. (Snails—Garden Snails, House Snails, Path Snails.) Gasteropoda of the family of Pulmobranchia; Helices Vivenetes, (Living Snails.) The mating of the snails is in the spring and by fall their half-moon-shaped opening is closed with a layer of calcium or lime, at which time they hibernate, when they are gathered and stored away, to be used later for medicinal purposes. For many hundreds of years a snail beverage was extolled as a sure cure for consumption. A tablespoonful of snails was ground in a mortar or a coffee mill, from which an infusion or decoction was made and sweetened with sugar to suit the taste and a cupful of this hot liquid was administered to the consumptive about three times a day. Along with many other of these singular concoctions for the treatment of tuberculosis, this snail cure has passed into the limbo of oblivion.

(i) Sheep Nanny. The excreta of the sheep or the goat was dried and ground, then given to children in the form of an infusion, which was much in use by the common people for the treatment of measles. However it was soon asserted by the consumptive that if this sheep nanny decoction contained such curative properties for measles as claimed, it must surely be good for consumption, so a sweetened extract of this sheep nanny excreta was served to the consumptive several times daily. Like all proclaimed remedies for the cure of consumption, its use eventually fell into disuse.

CLASS B.

Herbs for the cure of consumption were in use by the common people for many centuries.

These herbs were generally home grown, cut when their season was over, and stored in the attic, hung along the rafters. When they were needed for the consumptive patient, the necessary supply was taken down and prepared as tea. Such herbs or roots that could not be grown in one's own garden at home or those that had to be imported from foreign countries, were usually purchased at an apothecary shop. The roots, herbs and other plants from which drugs were prepared that were recommended for the cure of consumption are listed as follows:

Roots, Herbs, Barks, Woods, Seeds etc.—

1. Anachuite Wood. This wood was brought from Tampico and introduced into the markets of Europe and in 1859 into the United States. The natives of Tampico used it in the treatment of coughs and colds, particularly for colds in the chest; hence in both Europe and America it was highly recommended as a specific for consumption. In a pharmaceutical paper in 1860 a European writer and editor tersely remarked: "How many different forms of disease are embraced in the word 'consumption'? This word should be as a panacea, a universal application in all the different forms of lung diseases." In those early years every medicament applied to any other disease was sure to find, sooner or later a field in the consumption cure; however, this remedy never found much support and came early into disuse.

2. Gynocardia Odorata; Chaulmugra Odorata; Hydnocarpus Odoratus. The seed of a fruit grown from time immemorial in India. The oil (Chaulmugra Oil) expressed from this seed was used as a tonic and is supposed to possess blood-lessening properties. In India it has been used in hemorrhagic tuberculosis and in leprosy; and there it is considered as a vegetable mercurial, simulating its effects as does mercury in syphilis. There is no doubt but what chaulmugra oil possesses healing properties for treating both leprosy and tuberculosis, which is evidenced by the salutary effect of this drug in both diseases when given internally; and it is also very efficacious as a remedy when used externally, by local applications.

3. Hieracium; Lungweed. At one time this was judged a most dependable medicine for the treatment of consumption and for months at a time many a consumptive drank an infusion or decoction of this weed, hoping to arrest the disease. Because of its name, "Lungweed" was considered a specific—a remedy peculiarly and particularly adapted to cure "Lung" disease.

4. Pulmonaria; Lungwort; Lungweed; Lung Moss. This herb was very little used at first but down through the centuries it became more popular among the common people and even at the present time it is still in use as a remedy for the cure of consumption and in pulmonary hemorrhage in the form of a decoction or a tea, sweetened to suit the taste. And here again the name lends faith to the cure.

5. Hypericum Perforatum; John's Weed; Devil's Weed; Witches' Weed. This herb is no longer in use as a medicinal alleviative but in times past it was considered an astringent, an aromatic and a specific for the treatment of consumption.

6. Phellandrium Aquaticum; Water Fennel; Horse Fennel. At one time this was highly recommended for the treatment of consumption, by administering an infusion or decoction, sweetened to suit the taste, to the consumptive patient. For many centuries past this drink was liberally partaken of as a curative drug for tuberculosis, while today it is but another medical experiment chronicled in the history of this disease.

7. Galeopsis. About one hundred and fifty years ago this herb, known as "Consumption herb," also as "health tea," was popular as a prospective drug to aid in the cure of consumption. The sale of this herb was stimulated by the suggestive names of "consumption herb" and "health tea," but its use has now been entirely abandoned.

8. Plantago Major, another herb, which was much in favor years ago. A cup of this sweetened infusion was supplied for the consumptive to drink three or four times daily but this herb has now been long forgotten for such purposes.

9. Scolopendrium Officinarium; Deertongue. This weed was highly regarded as an effective home remedy among the common people, particularly in Europe where it was served as a sweetened decoction to treat all kinds of pulmonary diseases, especially the coughs of phthisical subjects.

10. Lichen Islandicum; Iceland Moss. An infusion or decoction which was largely em-

ployed among the common people as a remedy for the treatment of the young consumptive.

11. Drosera Rotundifolia; Sunweed; Maiden Blushes. For a time this herb was very little utilized for remedial purposes but in the last one hundred years it has regained its reputation as a typical remedy for the cure of consumption. It is also used for whooping cough and for all diseases of the air passages but is of no special medicinal value.

12. Tormentilla Potentilla; Radix Tormentilla; Tormentil Root; also Blood-root. Either in powdered form or as an infusion. The ordinary run of folks considered this root as a specific in the treatment of the consumptive; and it was also given in asthma and in all disturbances of the respiratory organs. It possesses no medicinal worth but the red color was thought to represent blood, hence it must be of value in tuberculosis.

13. Sanguinaria Canadensis; Blood-root. There is no disease known in medicine in which blood-root at some time or another has not been recommended for its supposed healing qualities. It was especially lauded for the beginning cases of consumption, the so-called incipient cases—if the cases could be so diagnosed. This root contains no medicinal value; however, it was believed that owing to its making a red infusion when put into hot water, it represented blood and as the consumptive regarded consumption as a blood disease, he imagined that this colored decoction must have a special salutary influence on his blood. Blood-root is now entirely in disfavor as a medicant.

14. Guaiacum; Resin of Guaiac. Some centuries ago this drug was much in evidence as a proposed specific in the treatment of the consumptive. A tincture was prepared by dissolving the resinous portion of guaiac in an alcoholic vehicle. It was fully described and included among the pharmaceutical preparations of that day. Guaiac was introduced into the apothecary shops as a remedy of great value for the cure of consumption but when guaiacol carbonate was advanced in the last century as an effectual compound for treating phthisis, the use of resin of guaiac was discontinued; and today both guaiacol carbonate and resin of guaiac are rejected as health restoratives for this disease. From the similarity of names, both of these drugs were considered specific cures in phthisis.

15. Ammoniacum; Gummi Ammoniacum. This drug also came into use for the cure of consumption; however, it was very short-lived for this purpose and is now only a memory.

16. Lactucarium: Lactuca. This curative preparation was made from the milky juice which exudes from the plant Lactuca Virosa, which fluid is somewhat toxic and simulates opium in its soporific effect. This drug was sought after during the past century as a remedy for cough in the phthisically afflicted persons but it is no longer upheld as giving such medicinal aid.

17. Macropiper; Kawa-Kawa. The roots of a plant found in the South Sea Islands, the fermented juice of which possesses intoxicating properties. This plant is indigenous to the Hawaiian Islands and in Honolulu a potion was prepared from this root, the manner of which is both disgusting and revolting. It simulates the practice of snuff-dipping as observed in some of our cities. The root was put into one's mouth and chewed, during which mastication the juice was extracted from the root by means of the saliva, which mixture was then spit into a container that had been placed in the center of a room. The chewers crunched the root until it was thoroughly exhausted, then spit every mouthful directly into this communion bowl, around which they sat in a circle. This assorted accumulation of sputa and extracted juice rapidly underwent an alcoholic fermentation, which, when sufficiently leavened, was drunk by the natives for its pleasing, intoxicating effect. For a time a draught of this liquid was highly recommended to consumptive patients and owing to its stimulating effect on the already buoyant spirits of the sufferers, it was considered a topical remedy but its duration of popularity was transitory.

18. Opium. From time immemorial this drug, in the form of a tincture, as a powder, or as an infusion has been recommended for the treatment and cure of consumption. Today we know that opium will not influence the phthisical process in the least—it is only for its anodyne and soporific effects that it has been used in the past and continues in favor at the present time.

CLASS C.

Pharmaceutical Preparations. Into this division may be placed all such remedies and medi-

caments that are prepared by the pharmaceutical houses or by the apothecary in his workshop, hence these remedies are of more recent date, some having been introduced as early as the eighteenth century but most of them date from the nineteenth. They will be described below in the order of their importance.

1. Creosote; Beechwood Creosote. The giving of creosote in the treatment of the consumptive disease is of comparatively recent origin. In the latter part of the past century it was deemed a sovereign remedy for the treatment of the phthisical but it gradually came into disfavor and today it is very little used for the treatment and cure of consumption. Its use had been attested by many good practitioners of medicine in the belief that it did possess curative properties but time and experience proved that its medical qualities were limited. As its ingestion lessens the secretions of the mucous surfaces, it had been recommended for the treatment of bronchial affections and in catarrh; hence, it was reasoned, creosote must contain curative properties that will favorably influence a consumptive process and the giving of small doses was most desirable. Even at the present time a mixture of creosote with cod-liver oil is still thought to be a beneficial combination for the medication of consumptive cases by physicians.

2. Glycerinum; Glycerine. This article of commerce has never been considered as a remedy in the treatment of consumption when used alone but when mixed with cod-liver oil to which it imparts a sweet taste, it is highly prized by the consumptive patient. A curative effect has never been attributed to glycerine but its use as an adjuvant, in combination with other remedies, improves their taste.

3. Maltum; Malt Extract. During the last two centuries an extract prepared from malt has been much in vogue. This extract is used as an emulsifying agent with many oils, especially cod-liver oil and prepared in this way, owing to its pleasing, sweet taste, it has been greatly in demand for the treatment of consumption; however, it has no curative properties as is so generally believed by the tuberculous patient.

4. Ferrum Albuminatum; Albuminate of Iron. This remedy is now well nigh forgotten as a specific for the many maladies for which it was prescribed; however, it is still a medicament of considerable value. Albuminate of iron when mixed with milk answers all the requirements of a good nutrient, hence its recommendation to tuberculous patients. For the medication of the consumptive during the last century it had a wide field but now it is of little use in this regard.

5. Syrupus Ferri Iodati (Syrup of the Iodide of Iron). This syrup and cod-liver oil have for many years been most highly prized as a medicament in the treatment and cure of consumption. In the past century this preparation was a strictly pharmaceutical remedy and remains as such at the present time. As a tonic this syrup may possess some medicinal value but as a cure or even as a benefit, when given to the consumptive, we have no proofs. We must admit, however, that very few drugs are administered to the consumptive these days.

6 Tincture Guaiac and Tincture Guaiac Ammoniata. These two tinctures of the resin of guaiac were much in use some years ago, chiefly in the last century. To dissolve the resin a strong alcoholic menstruum was required and in the administering of this tincture another alcoholic diluent was necessary so the ten to thirty or more drops were given in brandy or whiskey. As the consumptive is usually hopeful, with a buoyant spirit, the giving of this tincture in whiskey only served to increase the poor patient's cheerfulness, and he became more stimulated, which was considered as certain evidence that his disease was arrested. The giving of this tincture for consumption has now for many years been discontinued, still I do well recall that some forty years ago this tincture was administered for the cure of consumption. A middle-aged man, who was not a physician, neither was he a chemist nor an apothecary, became a little conversant with a few medicines while working in a laboratory of the Chicago Stock Yards, and convinced his friends that he had discovered a medicine that would positively cure consumption. A company was organized, an attorney secured as a member of the concern, and by advertising in country papers quite a number of far-advanced tuberculous patients came to receive the cure. It may be stated here, to the credit of the concern, that they were not charlatans—they were simply misguided, misinformed; they had no knowledge of medicine and did not know any better. No medicine was sold. Every patient was required to come to the office

for treatment two or three times a day, when the supposedly curative medicine was administered to each patient by the hands of the discoverer of this remedy. The treatment consisted of giving each patient about thirty drops of tincture of guaiac in a tablespoonful of whiskey. It is needless to say that not a single consumptive ever became well from taking this medicine. No physician was required, as the moribund condition of these patients was sufficiently advanced so that any one could make the correct diagnosis. I saw many of these unfortunates roaming around on the streets and about the home of the supposed cure. It finally dawned upon all of them that no cure for consumption had been discovered after all, and the concern eventually suspended their operations. Incidentally, in passing, it may be mentioned here that tincture of guaiac can be administered in an aqueous solution without the separation of the resinous particles, by giving it in milk—this, however, the aforementioned promoters did not know.

Pharmaceutical preparations that are usually prescribed for the use of the consumptive are designated as "Tonics" or "Body Builders," and it is very noticeable that most of such compounds contain a certain percentage of alcohol. They are simply stimulating mixtures to excite, in a measure, the buoyant nervous system and the hopeful spirits of the unfortunate tuberculous persons. An especially favorite prescription of a so-called "lung specialist," who was himself a phthisical individual, will illustrate my contention. A mixture of one bottle of John Hoff's Malt Extract (about fourteen ounces of a strong quality of beer), the juice of six lemons, six ounces of glycerine, and two ounces of sugar, was heated in a water bath for about fifteen or twenty minutes, and then sufficient Medford rum was added to make one quart. A teaspoonful to a tablespoonful of this compound was given three times a day—most tuberculosis patients preferred a tablespoonful three times a day instead of a teaspoonful. This occurred in the 80's of last century.

CLASS D.

Chemical Substances. Chemicals were not given for the treatment and cure of consumption in the seventeenth century, nor even in the eighteenth. As curative agents they came into use when chemical science had become established on a solid foundation and chemicals became known among the public as definite preparations that might possess medicinal value. It was not until the nineteenth century that chemicals for treating diseases of the human body came into general use, and for the cure of consumption we enumerate the following:

1. Manganese and its compounds were considered by many physicians of the last century as components of the blood, similar to its iron content, and it was deemed advisable to administer manganese compounds to the consumptive, thereby increasing the manganese component of the blood. This theory was disproved and its use as a favorable remedy in the treatment of consumptive disease was abandoned.

2. Iodoformium; Iodoform; Iodine Carbonate. With albuminous substances an albuminate of iodine can readily be compounded. In operative surgery for tuberculous peritonitis, very large doses may be employed with most gratifying results. In early operative practice it was most in use. During the last century a suspension of iodoform in cod-liver oil for internal use, was much in evidence; however, there is no advantage to giving pure iodine in cod-liver oil. Iodine as a remedy for the treatment of tuberculosis was not much in vogue during the past century, but today we know that the drug can be taken internally by the consumptive, in very large doses, with the most beneficial effects.

3. Nitrogenium; Nitrogen Gas. During the middle of the last century the inhalation of nitrogen, in lieu of ozone, was highly praised for the treatment of consumption, for asthma, for cough, for whooping cough, etc., but like ozone it was found to have no definite value, and had neither temporary nor lasting effect.

4. Salicin. A glucoside prepared from the bark of Salix—the willow or poplar tree. In the beginning of last century, when this drug first came into general use as a remedy for cough or whooping cough, the consumptives hopefully anticipated that it would prove a valuable remedy for their fever paroxysms, but its use was very limited and of little worth.

5. Acetonum; Acetone; Pyroacetic Spirits (an antiphthisical capsule consisting of acetone one part and cod-liver oil nine parts.) Although long ago this remedy was given for the relief of an irritable cough, and possibly with good success, it has been rejected for many years as a

mitigative medicine. Acetone, in the proportion of one part of acetone to one hundred parts of water, had also been used as an inhalant; and at one time was much favored as a medicament in the form of a demulcent (Acetone 2.5, Mucilage of Gum Acacia and simple syrup, each 25.0, water 150.0, to which a little acetate of morphine was added—about 0.3). A tablespoonful of this compound was given every three hours to the phthisical patient. At the beginning of the last century the medical profession approved this prescription, but today it is in disfavor.

6. Ammonium Urinicum: Urate of Ammonia (prepared from Guano—the dung of sea fowl). Some hundreds of years ago this was considered a specific in the treatment of consumption. It was given internally in the form of a solution or prepared in the form of an ointment to be applied locally. Its use as an antiphthisical remedy was never considered of much import; however, from the giving of ammonium urate to the consumptive for his ailment to the drinking of human urine was but a step. I vividly recall that in my earlier days, in the latter half of the past century, when I was just beginning the study of medicine, I made the acquaintance of a moribund young consumptive, about twenty-two years of age, who informed me that at last he had found a remedy which was curing his cough, and his disease as well, and that his remedy was nothing else than the drinking of his own urine. He said that every morning, after arising, he would draw a large glass or cupful of his own urine and drink it while it was still warm. "But, my good fellow, how can you drink your own urine?" I asked. He answered: "I must admit that at first it was a little repulsive, but since I have found that it will surely cure my disease, I have no difficulty in drinking it." This particular case came under my personal observation; however, I have knowledge of another one —but only from hearsay.

CONCLUSIONS AND SUMMARY

To epitomize the various views concerning the remedies used during the past years, and those which have been recommended as panaceas for the phthisical cure, would lead to endless controversies. Drugs were little used for the treatment of this disease in ancient times, but a change of climate, residence in the mountains, to remain much out of doors, to avoid intoxicants, venereal and other excesses, and to drink freely of milk—these were the regulations prescribed for the consumptive to follow.

The giving of drugs or medicines was then unknown, this beginning when the physician was called to the bedside and observed that he must give something for the mitigation of pain or for the relief of symptoms. With the establishment of the first sanatorium for the cure of the tuberculous by Dr. Herman Brehmer, in Gorbersdorf, Germany, in the middle of the last century, a step was taken toward a method of treatment, which was accompanied by the giving of drugs, with rest and passive exercise, a nutritious diet and a proper mode of living. About 1882, in our own country, Dr. Edward L. Trudeau, himself a consumptive, at Lake Saranac, New York, learning of the Brehmer and Dettweiler treatment of tuberculosis, at once applied the method to a few of his patients, at a hastily improvised sanatorium and was much impressed with its success. However, it was not until the discovery of the "tubercle bacillus" by Dr. Robert Koch, in 1882, as the causative, etiological factor of all the various forms of this disease, that an intensive study of tuberculosis began, which has been maintained ever since, with a gradually increasing interest from year to year. Drugs now began to be more freely given than formerly, but a still greater impetus followed when the medical treatment for consumption was accompanied by a surgical technique. From many years of observation, chiefly during the last century, it has been noted that if the lungs are quiescent the tuberculous process will become arrested. After considerable experimental work by English, French, German, Italian and other nationalities interested in pulmonary studies, Forlanini of Padua, Italy, called attention to his observations, first in 1882, and again in 1894, at the International Tuberculosis Congress in Rome, on pneumothorax, or lung compression, and in our country at the Dr. John B. Murphy School, in 1898 and 1899. Still the surgical technique for the arrest of the tuberculous process was very little heeded; and the first paper presented before the National Tuberculosis Association's annual meeting by Dr. Mary E. Lapham, of Highland, N. C., who in 1912 reported her findings on thirty-one cases of lung compression, was severely criticized and

even ridiculed by a supposed authority on the disease; tuberculosis. The same fate, but no criticism, met the reading of a paper on the same topic by Drs. Louis Hamman and Martin B. Sloan, of Baltimore; and it was not until two years later, when Dr. Gerald Webb, of Colorado Springs, presented his paper on lung compression, that phthisiotherapeutists quickened to the importance of this valuable therapeutic measure, and fourteen leading clinicians participated in the discussion. Since that time and up to the present, one or more papers are offered at every meeting of the National Tuberculosis Association on this important surgical measure. Compression of the lungs, or pneumothorax, was at first applied on the tuberculous subject in only exceptional, in extreme cases—hemorrhagic, high fever, etc., but, as a rule, the principle of lung compression is applied today in most every case of tuberculosis—incipient, moderately advanced, and even in the far-advanced cases. In the cure of tuberculosis, not only pneumothorax as a surgical measure is applied, but all the other methods are indicated in selected cases—like phrenecotomy, phrenececectomy, exeresis, pneumonectomy, pneumolysis, thoracoplasty, etc. Under medical and surgical care in the treatment of tuberculous patients, the six most important rules, as indispensable adjuncts for the arrest of the disease, which are as much necessary now as ever, are rest, wholesome food, wholesome fresh air, ease of mind, obedience and time. Since the discovery of the tubercle bacillus, which has been followed by an intensive study of tuberculosis as a disease entity in all parts of the world, both the administration of the medical remedies and the application of the surgical measures, being interwoven, are essential in the arrest and cure of tuberculosis.

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Only a convict likes to be stopped in the middle of a sentence.—*Reader's Digest.*

THE DEATH TOLL OF THE HUNTING SEASON

According to the statistical bulletin of the Metropolitan Life Insurance Company, August, 1938, there is each year nearly 7,000,000 persons who obtain licenses to hunt with firearms. Licensed to kill wild animals, the inexperienced, unskilled, or careless hunter unfortunately may become the killer of men. The frequent deaths and injuries by accidental shooting among hunters indicate that many either know or care little about the proper handling of a gun.

About 1,000 persons are killed annually in such hunting accidents. Government statistics for the entire country reveal that nearly 3,000 persons are fatally wounded each year in firearm accidents generally. The statistics do not show separately what percentage of these occur in hunting, but the records of several individual States, as well as those of the Industrial policyholders of the Metropolitan Life Insurance Company, indicate that about one-third of the total—or 1,000—fatal shooting accidents are incurred by hunters afield. Hundreds more are killed annually by firearms while preparing for the hunt—cleaning guns, at target practice, etc. In the hands of children, hunters' guns carelessly left around the home have far too often figured in tragedies.

An analysis of the records of 133 deaths in typical shooting accidents on the hunt, which occurred among Industrial policyholders of the Metropolitan Life Insurance Company in the period of 1935 to 1937, inclusive, reveals some details of the conditions surrounding these fatalities and suggests precautions which the hunter must observe to avoid such accidents. These fatalities fall mainly into three classes: (*a*) Deaths from wounds accidentally self-inflicted; (*b*) deaths due to accidental shooting by a companion; and (*c*) deaths from accidental shooting by hunters in another party.

Deaths resulting from self-inflicted wounds were the most frequent, accounting for a total of 60, or 45 per cent of the fatalities. Sixteen of these deaths resulted when hunters slipped, stumbled, or fell, and their guns were accidentally discharged on hitting the ground or other objects. Risky and unsteady footing while climbing banks, slipping on frozen ground, failure to keep the gun locked in the "safe" position, and carrying the gun in dangerous positions, were some of the contributing factors in these accidents. Climbing over or through a fence while carrying a loaded gun, or pulling a loaded gun muzzle-first through a fence, caused 13 deaths. Ten were killed as they lifted loaded guns from automobiles, canoes, or other vehicles of transportation. Four deaths took place when guns carelessly carried became entangled in thick brush and discharged. Four men also were killed by the accidental discharge of guns held between their knees as they sat on the ground. Other deaths from self-inflicted wounds resulted when hunters dragged loaded guns up trees, dropped guns to the ground, or when guns with faulty mechanisms discharged.

Accidental shooting by a hunting companion was responsible for 48 of the tragedies, or 36 per cent. The

accidental discharge of a companion's gun caused 39 fatalities. Excitement, overeagerness, hurry, or carelessness when about to shoot or on suddenly sighting the desired quarry were frequent causes. In some cases the hunter accidentally hit his gun against a tree as he was about to shoot. Others, as in the case of self-inflicted wounds, were using guns with faulty mechanism. Several were killed when a companion's gun dropped to the ground or hit an object as he tripped, stumbled, or fell to the ground. By a curious irony of fate, one man was killed when he grasped the arm of a companion, just as the latter pulled the trigger, to prevent him from shooting at a bird protected by the game laws. Five were killed when they stepped into the line of fire of another marksman. Three fatalities resulted when bullets struck a tree or frozen ground and ricocheted, striking a companion of the marksman.

Nineteen persons, or 14 per cent of the total 133 victims, were killed by hunters in parties other than their own. Nine of these 19 were mistaken for deer or smaller game by hunters who were too impatient to take the time to distinguish the object definitely, or who hurriedly fired as soon as they saw a disturbance in thick underbrush. Stray bullets accounted for six deaths. Four fatalities occurred when a hunter coming from behind a building, over the crest of a bank, etc., stepped into the line of fire of another's gun.

Five hunters were killed while resting, by the accidental discharge of guns set against rocks or trees. In some manner these guns fell or were knocked down and discharged. One hunter was shot by a farmer who mistook him for a prowler.

Not until hunters become more careful in the handling of guns and realize the dangers involved can we expect a decline in accidental hunting deaths. Some States have recently made efforts to promote safety among their hunters. Laws have been passed giving State Conservation Departments authority to revoke licenses for long periods or permanently when carelessness is shown. In certain cases a charge of manslaughter has been made mandatory. These are moves in the right direction, and it is to be hoped that they will be extended.

CATHOLIC HOSPITAL ASSOCIATION CONDEMNS SOCIALIZED MEDICINE; STANDS BY A. M. A.

The *Buffalo Academy of Medicine Bulletin* states that a resolution adopted at the closing session of the twenty-third annual convention of the Catholic Hospital Association of the United States and Canada, held in the 174th Armory, Buffalo, June 13 to 17, disapproved the socialization of medicine by declaring "that whatever shifts in viewpoint concerning the fundamentally ethical considerations of medical care be introduced, those basic principles concerning the personal relationship of the patient and physician, the implication of sound, ethical obligations, the fixing of personal responsibility for medical care, the confidential character of the relationship between patient and physician and similar fundamental considerations must by all means be safeguarded lest we enter upon untried social procedures in supplying medical attention to the detriment not only of public health, but also to the detriment of the individual patient's health. The Association, therefore, reiterates its confidence in the persisting validity of medical practice as enunciated by the American Medical Association."

In regard to the extension of the Federal hospitalization program, the Association recorded its fears "that the persistent repression of the importance of the private hospital and the aggrandizement of the government institution might result in undesirable, even harmful standardization, in extravagance and waste, in inefficiency, and probably will undermine the civic spirit in communties precisely at a time when it seems most necessary to strengthen that spirit and the community's increasing consciousness of the importance of adequate health care."

Three hundred and twenty-five hospitals were represented at the convention by upwards of 800 delegates.

HIGH HUMAN TEMPERATURE

We have been asked more than once for information relative to the highest temperature that the human body can reach and still survive. We quote the following taken from queries and minor notes of the American Medical Association Journal. The data is furnished by William D. Reid, M. D., Boston.

To the Editor:—The subject of high human temperature is discussed in Queries and Minor Notes in THE JOURNAL, February 5, page 461, and April 2, page 1127. Regarding the highest temperature that the human body can reach and still survive, the following (taken from Reid, W. D.: One Hundred and Fifty-Eight Cases of Heat Prostration Treated at the Boston City Hospital, July 2-13, 1911, *Boston M. & S. J.* 165:643 [Oct. 26] 1911) may be of interest:

Temperature	Cases	Deaths
—105	10	1
105—106	8	4
106—107	8	5
107—108	6	6
108—109	14	10
109—110	15	12

The high mortality, 58 per cent, in these cases of heat stroke was doubtless influenced by the complications: At admission to the hospital: alcoholism, failing heart, edema of the lungs and convulsions. Subsequent: delirium tremens, persistent coma, pneumonia and recurrence of fever.

EVERYTHING BUT SCIENCE, RELIGION AND SEX ARE STANDARDIZED IN AMERICA

Sinclair Lewis assails propaganda. We quote the *Los Angeles Herald-Express*, January 19, 1938, as follows:

Lively as a cricket, a tall scholarly man with red hair skipped from subject to subject in conversation like a water bug across the surface of a pond.

It was novelist and Nobel prize winner Sinclair Lewis talking at the Biltmore Hotel after his arrival here from Chicago by Santa Fe train to lecture on

"Propaganda and Poppycock" tomorrow night at the Shrine Auditorium.

"Everything but science, religion, and sex are standardized in America," said Lewis as he crossed his elegantly silk-sheathed ankles.

"This is the result of the mass thinking that is spread to millions through the radio, movies, and press.

"All that would be necessary for a dictator to end democracy would be to control the media that already are ending individuality in America.

"Since we are all coming to think and talk alike, all that is necessary is to get us to thinking a dictator would be a good idea." . . .

Skipping back to propaganda, Lewis said:

"These propaganda forces are standardizing American thought and may make the nation susceptible to anti-democratic forces, singularly enough, by using the very scientific marvels that pioneer American individuality and initiative produced. . . .

"The syndicated writers are among the most effective propagandists, for they influence millions of readers, and for that reason the quality of their writings ought to be increased tremendously."

NEED OF REDETERMINING SCHICK NEGATIVENESS IN SCHOOL CHILDREN

A. B. Schwartz and F. R. Janney, Milwaukee (*Journal A. M. A., May* 21, 1938), state that during the last year or two there has been an apparent increase in the incidence of diphtheria among supposedly Schick negative children. These occurrences warrant serious consideration of the present status of Schick immunity in the present large school population. As it is now the practice to immunize against diphtheria at about 9 months of age and to perform a Schick test within the following several months, many school children have had an interval of five years or more following the immunization procedure by the time they enter school. The importance of a Schick test following the immunization procedure has been repeatedly emphasized, but, once a negative Schick test has been obtained, the immunity has been generally assumed to be permanent. Whatever materials or method of immunization is followed, the immunity of the school child to diphtheria should be insured by either a routine Schick testing on all children entering school or by the administration of a routine dose of 1 cc. toxoid at the time of entering school, as suggested by Fraser and Brandon. In order to maintain the low incidence of diphtheria in the United States, one of these two measures should be made a routine part of preventive medicine.

Marriages

ROBERT CLEMENTS to Miss Eunice Tanner, both of Danville, Ill., in Champaign, August 4.

JOHN M. DORSEY to Mrs. Charlotte Burns Hoefer, both of Chicago, June 29.

RUDOLF WILLIAM HACK, Momence, Ill., to Miss Willette Mary Drummond of Chicago in July.

Personals

Dr. Paul H. Harmon of Chicago, Illinois, addressed the Woodford Medical Society on Monday, September 19, on the subject "The Diagnosis and Treatment of Suppurative Arthritis of the Hip with Special Reference to Pathological Dislocation.

Dr. Herman M. Soloway, Chicago, has been appointed venereal disease control officer of the State Department of Health. The newly created post was made possible by funds allotted to the state by the U. S. Public Health Service. Dr. Soloway graduated at the University of Illinois College of Medicine in 1922.

Dr. Loren L. Collins, Chicago, has been appointed full time medical director of the LaSalle County Tuberculosis Sanatorium, Ottawa, effective September 1; Dr. Albert J. Roberts has held the position since it was created in 1919 on a part time basis.

Dr. Joseph H. Kinnaman, Charleston, W. Va., has been appointed assistant health commissioner of Peoria with supervision of school health activities, effective Aug. 15. Dr. Kinnaman formerly served as health officer of Topeka, Kan., as assistant health commissioner of Cincinnati, as instructor, department of pharmacology and materia medica, State University of Iowa College of Medicine, Iowa City, 1927-1930, and as deputy commissioner to the Iowa State Department of Health in charge of child health and health education activities.

Clifford Grulee and William J. Dieckmann presented the scientific program at the September 22nd meeting of Knox and Warren County Medical Societies at Galesburg. Their subjects were "Care of the Premature Infant" and "Forceps Delivery."

At the meeting of the Wisconsin State Medical Society held in Milwaukee, on September 15th, Herman L. Kretschmer read two papers by invitation. One was on the "Medical Management of Chronic Prostatitis" and the other on the "Significance of Blood in the Urine."

William D. McNally delivered an address before the Michigan State Medical Society in De-

troit on September 21st, on "The Sequelae of Carbon Monoxide Poisoning."

The joint annual session of the American Congress of Physical Therapy and the American Occupational Therapy Association, was held at the Palmer House, in this city, September 12, 13, 14 and 15.

The Second Annual Symposium on Occupational Disease of the Department of Industrial Medicine of the Northwestern University Medical School was held on September 26 and 27, 1938 at Thorne Hall on the Chicago Campus.

The Fifteenth Annual Meeting of the North Central Branch of the American Urological Association was held in Peoria, on September 29, 30 and October 1.

James H. Hutton addressed the Jefferson-Hamilton County Medical Society at Mt. Vernon, September 20, subject "Endocrine Therapy of Proven Value."

The Second Annual Symposium on Occupational Disease of the Department of Industrial Medicine of the Northwestern University Medical School was held on September 26 and 27, 1938 at Thorne Hall on the Chicago Campus.

Theodore T. Stone has just returned from the Union of South Africa where he addressed the British Medical Association, South African Medical Association, the John Saner Medical Club and the Graduate Medical Association of the Witwatersrand University of Johannesburg.

I. Harrison Tumpeer addressed the Graduate Education Meeting under the joint sponsorship of the Indiana State Medical Association, Third District Medical Society, and the Orange County Medical Society at the French Lick Springs Hotel on Wednesday, September 7 on the subject of "Pediatric Adventures in Allergy."

Arthur H. Conley was invited to address the Marion County Medical Society on September 15, subject, "Injuries to and Fracture of the Bones."

The Fifteenth Annual Meeting of the North Central Branch of the American Urological Association was held in Peoria, Illinois on September 29, 30 and October 1.

At a meeting of the Peoria County Medical Society at Peoria, September 20, Drs. Ford K. Hick and Conrad S. Sommer, Chicago, will discuss various aspects of internal medicine.

A symposium on pediatrics and obstetrics will be sponsored by the Jo Davis and Carroll County Medical Societies at Elizabeth, September 21; the speakers will be Drs. Arthur H. Parmelee, Oak Park, and William F. Mengert, Iowa City, on "Diseases of the Newborn" and "Treatment of Prolonged Labor" respectively.

Dr. Raymond A. Tearnan, Decatur, will address the Christian County Medical Society September 21 on "Endocrine Factors in Various Gynecologic Disorders."

The Henry County Medical Society was addressed in Kewanee September 8 by Dr. Charles E. Galloway, Evanston, on obstetrics. A paper on pediatrics was read by Dr. John A. Bigler, Highland Park.

Dr. M. Herbert Barker, Chicago, discussed "Nephritis and Edema" before the Kankakee County Medical Society at Kankakee, September 8.

At a meeting of the county medical society at Effingham, September 13, Dr. Frank Deneen, Bloomington, spoke on "Diagnosis and Medical Treatment of Liver and Gallbladder Conditions."

Dr. Herbert E. Schmitz, Chicago, discussed gynecology before the Coles-Cumberland County Medical Society at Mattoon, September 14.

The Marion County Medical Society was addressed at Centralia, September 15, by Dr. Arthur H. Conley, Chicago, on "Injuries to and Fracture of the Bones."

Dr. Arthur E. Hertzler, Halstead, Kan., discussed the thyroid gland before the Sangamon County Medical Society in Springfield, September 1.

Dr. Edwin C. Ernst, St. Louis, discussed cancer before the Madison County Medical Society in Alton, September 2.

Dr. Martha MacDonald, who for three years has been in charge of the Children's Division of the Department of Psychiatry at Michael Reese Hospital, has been appointed director of a new child guidance clinic established in New Orleans. This clinic has been made possible through the contribution of Mr. Samuel Zemurray, President of the United Fruit Company. It will be closely associated with the Departments of Medicine of Tulane and Louisiana State University and promises to fill a long felt need in New Orleans and to provide leadership to this section of the country. No announcement has been made as yet of the appointment of a successor to Dr.

MacDonald at Michael Reese Hospital in Chicago, although such an appointment will be made.

News Notes

—The University of Chicago has appointed a committee on cancer to correlate its program of research and the clinical treatment of cancer. According to the announcement the creation of the committee, which will operate virtually as a cancer institute, was made necessary by the comprehensive nature of modern investigation of the disease. The new committee will correlate all basic research with the efforts of the clinical departments and serve as a clearing house for all the university investigators in nine departments; it will also advise the administration as to needs and policies of the general program. Members of the committee include:

Dr. Alexander Brunschwig, chairman of the committee.

Dr. Fred L. Adair, chairman of the Department of Obstetrics and Gynecology and Chief of Staff of the Chicago Lying-In Hospital.

Dr. Percival Bailey, Professor of Surgery (neurosurgery) and Neurology.

Arthur H. Compton, Ph.D., Charles H. Swift distinguished service professor of physics.

Dr. George F. Dick, chairman of the Department of Medicine.

William D. Harkins, Ph.D., Andrew MacLeish distinguished service professor of chemistry.

Dr. Paul C. Hodges, Professor of Roentgenology.

Thorfin R. Hogness, Ph.D., Professor of Chemistry.

Fred C. Koch, Ph.D., chairman of the Department of Biochemistry.

Ezra J. Kraus, Ph.D., chairman of the Department of Botany.

Dr. Dallas B. Phemister, chairman of the Department of Surgery.

Maud Slye, Sc.D., Associate Professor of Pathology.

Dr. Paul E. Steiner, Assistant Professor of Pathology, secretary.

Dr. Harry Gideon Wells, chairman of the Department of Pathology.

Announcement was also made that the university had received a total of $11,750 in grants and gifts for work on cancer. Three grants totaling $7,500 were from the National Advisory Cancer Council of Washington and will facilitate research on the influence of cancer on stomach secretions, research on hormones and on chemical substances in cancer tissues. The International Cancer Research Foundation made a grant of $2,000. The Educational Association on Cancer has given the university $2,250 to establish a lectureship on cancer and bring noted scientific speakers to the quadrangles.

—A drive against syphilis will be launched in the city, September 5, by business groups, who will participate in a campaign started last year by the Chicago Department of Health under the auspices of the U. S. Public Health Service. Included in the cooperating agencies are the State Street Council, representing major loop merchants; the Chicago Association of Commerce, representing leading industries; the Cook County Retail Council, an organization of community merchants, and the Illinois Federation of Retail Associations, representing twenty-one city and state merchant associations. Their first step will be to provide educational and lecture material on syphilis for all employees, according to the Chicago *Tribune*. It was stated that thirty-three concerns, including steel companies, drug stores, laundries, restaurants and bakers, have provided syphilis testing programs for their employees since last April. Since last November, when the field tests began, 79,533 have volunteered, including 7,421 high school and college students and 6,742 grade school pupils.

—A new building to replace the central structure of the present St. John's Hospital, Springfield, is now under construction. When completed, the main part of the unit will be twelve stories high and cost $1,200,000. The first floor will accommodate the physical therapy department, kitchens, coffee shop, pharmacy and central sterilizing department as well as the lobby and waiting rooms. The second to seventh floors will contain rooms and wards, while the eighth floor will be devoted to infectious diseases. The ninth floor will contain the septic surgical department, surgical dressing and specialists' departments, separate provisions being made for treatment of the eye and throat, dental work and bronchoscopy under both local and general anesthesia. The operative floor is the tenth with

laboratories on the eleventh. Solariums and storage rooms occupy the twelfth floor. The thirteenth and fourteenth floors cover only a small part of the building area and are used for the mechanical equipment. Rev. J. L. Gatton is director of the hospital.

Deaths

GEORGE STEWART ALLEN, Mackinaw, Ill.; Rush Medical College, Chicago, 1902; also a dentist; aged 70; died, May 5, of heart disease.

CARL L. CHENEY, De Kalb, Ill.; Chicago Homeopathic Medical College, 1902; aged 63; died, July 9, in the Public Hospital, of heart disease.

CLYDE LOWE CASEY, Chicago; College of Physicians and Surgeons of Chicago, School of Medicine of the University of Illinois, 1913; member of the Illinois State Medical Society; served during the World War; aged 49; died, July 19, in Marion, Ill., of chronic lymphatic leukemia.

THOMAS A. COPELAND, Athens, Ohio; College of Medicine and Surgery, Chicago, 1887; member of the Ohio State Medical Association; for many years secretary of the Athens County Medical Society; served on the local examining board during the World War; aged 73; died, July 9, of cerebral arteriosclerosis and hypertension.

WILLIAM J. DUGAN, Paris, Ill.; Missouri Medical College, St. Louis, 1899; aged 64; died, July 12.

JOSEPH R. EBERSOLE, Monmouth, Ill.; Hahnemann Medical College and Hospital, Chicago, 1888; medical director of the Illinois Bankers Life Assurance Company; formerly member of the school board and county coroner; aged 78; died, July 29.

CHARLES DUDLEY ELDRED, a Fellow A. M. A., Joliet, Ill.; Northwestern University Medical School, Chicago, 1914; fellow of the American College of Surgeons; served during the World War; past president of the Will-Grundy County Medical Society; surgeon to St. Joseph's and Silver Cross hospitals; aged 51; died, June 25, in St. Luke's Hospital, Chicago, of chlelithiasis, common duct stone and acute pancreatitis.

EMANUEL FRIEND, a Fellow, A. M. A.; Chicago; Rush Medical College, Chicago, 1890; formerly instructor in surgery at his alma mater; fellow of the American College of Surgeons; for many years on the staff of the Michael Reese Hospital; co-editor of the fourth edition of "Principles of Surgery," by Dr. Nicholas Senn; aged 70; was found dead, July 19, of chronic myocarditis.

JAMES MICHAEL GLYNN, Chicago; Rush Medical College, Chicago, 1892; member of the Illinois State Medical Society; aged 71; died, July 3, of uremia.

GREEN EWING HILL, a Fellow, A. M. A.; Girard, Ill.; Rush Medical College, Chicago, 1890; past president of the Macoupin County Medical Society; aged 75; died, July 3, of heart disease.

FRANK KADLEC, a Fellow, A. M. A.; Chicago; Loyola University School of Medicine, Chicago, 1916; served during the World War; for many years attending physician to the Infant Welfare, Department of Health, City of Chicago; on the staff of the Jackson Park Hospital; aged 48; died, July 14, of pulmonary embolism and acute appendicitis.

OSCAR F. PLUMMER, Macon, Ill.; St. Louis College of Physicians and Surgeons, 1903; aged 67; died, June 14, of cerebral hemorrhage.

ANNETA AYERS SAUNDERS, a Fellow, A. M. A.; Chicago; National Homeopathic Medical College, Chicago, 1896; Harvey Medical College, Chicago, 1897; Dunham Medical College, Chicago, 1899; aged 76; died, June 20, of chronic myocarditis and nephritis.

JOHN B. SCRUGGS, O'Fallon, Ill.; St. Louis College of Physicians and Surgeons, 1898; member of the Illinois State Medical Society; past president of St. Clair County Medical Society; aged 71; died, July 4.

AUSTIN KEELER VAN DUSEN, a Fellow, A. M. A.; Chicago; Northwestern University Medical School, Chicago, 1923; clinical assistant in pediatrics at his alma mater, 1930-1933; on the staff of the Illinois Masonic Hospital; aged 39; died, June 22, of coronary occlusion.

CHARLES BRUCE WALLS, Chicago; Chicago Homeopathic Medical College, 1894; aged 81; died, June 24, in the Veterans Administration Facility, Hines, Ill., of bilateral pyelonephritis.

Dr. J. R. Ebersole, a member of the Fifty Year Club and an Emeritus Member of the Illinois State Medical Society, died at Monmouth on July 29, 1938. Dr. Ebersole was born in Pennsylvania in 1859, was graduated from Hahnemann Medical School, Chicago, in 1888, and soon after his graduation, located in Monmouth. He had a special inclination for obstetrics, and had records of more than 2,500 cases which had been under his care.

In 1897 he was one of a group which formed the Illinois Bankers Life Assurance Company, and was medical director of that company until his death, a period of 41 years. He was probably the oldest medical director of a life assurance company in years of service, in the entire country.

Dr. Ebersole was local surgeon for the C. B. & Q. Railroad for 36 years, a Fellow of the American Medical Association, a member of the Illinois State Medical Society, the Warren County Medical Society, for more than 35 years. He married Miss Addie M. Over of Sterling, Illinois, on October 15, 1890. The surviving members of the family are Mrs. Ebersole and three children, Dr. H. Glenn Ebersole of Monmouth, Mrs. Ruth Zimmer of Colorado Springs, and Robert Ebersole of Evanston.

For many years Dr. Ebersole taught a men's bible class at the Methodist Church; he was a member of the Monmouth Rotary Club, a 32nd degree Mason, and a member of Mohammed Temple, A. A. O. N. M. S., in Peoria, and was always interested in civic affairs in his home community. Although in poor health for several years, he carried on his insurance work and maintained his interests in church and clubs to the end.